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NOTICE.

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The Tobacco Industry in Natal.

IN June last the Director of Agriculture received a private letter from some London friends who are largely interested in the tobacco trade. The following is an extract from that letter:—

"Of course you know that we are largely interested in tobacco, and lately there has in this country sprung up a demand for Transvaal tobacco. No doubt in your new experience this may

come to your notice, and may give an impetus to its cultivation. But the cultivation of the tobacco is not all; it wants careful manipulation after it is grown, and the curing and preparing for the market is quite a fine art, and anyone who would cultivate it largely should get an expert to look after the drying and curing. A great deal of money has been spent here on its cultivation, but the

climate is too fickle to get fine tobacco, and it generally ends in people losing their money; it grows too dark, and too large and coarse in the leaf. No doubt this can be obviated in a climate like yours by irrigation and using the proper kind of seed. . . . In the past this industry has been much neglected, and can easily be made very remunerative to any one with capital and pluck."

To this letter a private reply was sent. From that reply extracts have appeared in the *Daily News* and in the London trade journal *Tobacco*. The following is the extract as it appeared in *Tobacco*:—

"A gentleman resident in Natal, practically acquainted with the tobacco trade, writes as follows:—'As to tobacco, there is a fair amount produced in Natal, and there is no doubt Natal, as well as most parts of South Africa, is climatically suited to tobacco growing. Sooner or later this country will be recognised as one of the principal tobacco producers for the world's markets. Natal could export the leaf, the finished tobacco, and cigars. Some of the cigars are excellent; I like them almost as well as the ordinary Havanas. As to the pipe tobacco, a great deal of inferior stuff has been put on the market the last two or three years, owing to the War having had the effect of stopping the production of Magaliesburg (Transvaal) tobacco, and at the same time creating an extraordinary demand for the

supply of the troops, so that 3s., 4s., and 5s. a lb. has been easily obtainable for anything in the shape of tobacco. Under these circumstances you will understand there has been little incentive to adopt improved methods. But the better class of growers have been looking to the future and studying how to effect improvement. Improvement will come, however, only with time, and as a result of local experience. . . . As to a Tobacco Expert: Unless a tobacco grower has had experience in several countries his ideas are so local that he is unable to adapt them to the new conditions of a new country. Consequently he gives advice, correct enough, no doubt, in the country from which he has come, but which leads to disaster in a new country. A tobacco expert would be all right if he were level-headed enough to lie low for two or three years until he had had time to study and experiment with the conditions of his new country. . . . All the principal varieties of tobacco seeds are imported into this country, and in some cases a good deal of capital is being expended in the industry. It would be a good thing if English capitalists were to send a representative out here to push the industry.'"

Correspondence is still proceeding, and there is some prospect of English firms sending out a representative to study the matter locally.

District Reports.

IXOPO, 24th December.—During the last week lovely rains have fallen, and the crops, although somewhat backward, are looking well. One or two cases of redwater have occurred, but on the whole there is scarcely any sickness among the cattle. Mr. Justice Boshoff held a Special Circuit here on the 10th instant, and two Natives were found guilty of sheep stealing and sentenced to be imprisoned with hard labour, and one to receive a whipping of 25 lashes. I think we should endeavour to obtain the assistance of the Chiefs to suppress cattle stealing, and I consider it would be of great advantage if the Crown were to cause the Chief or his representative to be present when members of his tribe are charged with cattle stealing, and in the event of the offenders being found

guilty, the Chief to be informed the Government holds him responsible for the acts of the members of his tribe, and that unless he endeavours to stop the stealing the Government may punish him by not paying him his quarterly salary, or may even remove him from the position of Chief. Great interest was taken in the recent election, and out of 689 registered voters no less than 497 recorded their votes.

FRANK E. FOXON, Magistrate.

LOWER UMFOLOZI, 5th January.—The weather was most trying during the past month, owing to continuous excessive heat; only four or five pleasantly cool days were experienced. Rain fell on fourteen occasions: five heavy downpours and two terrible

thunderstorms included. The Native's hut at Magistrate's residence was struck by lightning; the inmates and hut escaping annihilation in a marvellous way; the only casualty was the loss of a cat, which was killed outright on the bare floor where it lay. Crops generally are doing well, and not a single report of locusts came to hand. Stock suffered pretty severely owing to rinderpest, from which eighteen head of cattle perished in a little over three weeks. Other three head were reported as having died from redwater, sunstroke, and a lung complaint, respectively. A horse at the Magistracy, apparently affected with blue tongue, was cured from its ailment in a remarkable way by Trooper Morrison, N.P., who dosed it with rawlinseed oil and turpentine. On or about the 18th the Mbatuzi Drift was closed to cattle traffic owing to rinderpest, and by the 25th Messrs. George Higgs and George Green were appointed inoculators. Outbreaks of the pest occurred at the seat of this Magistracy, Green's Mbatuzi store, and two or three Native kraals between said places; also among Mr John Hoogvorst's cattle at the Okula store, and in the location of Chief Mkonto, between the Ukula and Mdeni

streams, and in the Mbonambi location on the sea coast.

A. R. R. TURNBULL, Magistrate.

NEW HANOVER, 23rd December. — The drought has at last come to an end, and the farmers and Natives are busy ploughing. I have heard of no cases of infectious diseases amongst cattle in this Division.

A. RITTER, Magistrate.

NQUTU, 3rd January. — Since my last report the state of affairs has undergone a considerable change for the better. Rain has fallen in frequent and sufficient quantities to favour agricultural development, and given a continuance of the same conditions, the harvest, though a late one, should be good. The registered rainfall for December was 3.23 inches. There has been one fresh outbreak of rinderpest during the month, happily not a serious one; and but for this the Districts would have been clean. There is a supposed case of "farcy" at Mkonjana, but so far I have not received the veterinary report thereon. Grazing is excellent now, and consequently all classes of stock are in good condition.

C. HIGNETT, Magistrate.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 3a.—A Scotsman, 27 years of age, who has been in Natal 18 months; came out on account of his health; produces good testimonials from Home and Colonial employers. Wishes to learn farming; is prepared to give his services in return for his board and lodging for a few months.
- No. 13a.—An Australian, who has been serving throughout the war is recommended with every confidence by his Commanding Officer. Asks for salary of £84 per annum.
- No. 17a.—Australian of 27. Has had considerable experience in New South Wales, and has taken sole charge of several sheep and cattle stations with credit. Produces excellent recommendations.
- No. 21a.—Applicant is 25, and of Scotch descent. Has had several years' experience as an overseer on a sugar plantation in the West Indies; is acquainted with book-keeping.
- No. 22a.—A corporal in the Imperial Yeomanry. Is 24, has had experience of mixed farming in England, and is prepared to accept an engagement on a farm in Natal.

- No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.
- No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.
- No. 29a.—A married man of 32. Was trained as a nurseryman in England; was engaged for three years upon forestry work with the Transvaal Gold, Land and Exploration Co., where he had entire charge of a plantation of 300 acres. Must have a living wage.
- No. 30a.—Has had a number of years' experience of agricultural and stock farming in Umvoti County, and is prepared to take a situation as an assistant on a farm. Give good references.
- No. 31a.—Is at present attached to the K.S.L.I., but is anxious to become an assistant on a farm. Is 27, and has had ten years' Home and Colonial farm experience.
- No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

Garden Notes for January.

By W. J. BELL, Florist and Seedsman, Maritzburg.

KITCHEN GARDEN.—As soon as plants are strong enough, commence planting out Cauliflowers from the seed beds sown last month.

In gardens where Cauliflowers are in great demand two or three sowings should be made, December, January, and February, to supply a succession.

The best varieties are Early London, Early Erfurt, and Veitch's Autumn Giant. For the coldest districts of the Colony Brocoli will be found more suitable, being more hardy than the Cauliflower, and able to withstand a greater degree of cold. As regards soil, Cauliflowers will thrive on light land if heavily manured, and a quick growth may be promoted by liberal watering in dry weather. Good cultivation is needful or the crop will be worthless, and whatever the nature of the soil it must be well broken up and heavily manured.

From the seed beds the young plants should be pricked out two or three inches apart on to a well prepared bed, from which they may be planted out when 6 or 8 inches in height.

The larger sorts, like Veitch's Autumn Giant, should be planted not less than three feet apart each way, and the smaller varieties two and a half feet apart.

Where planting has been left till the season is far advanced, plant in heavily manured trenches, same as Celery.

The Winter crops of Cabbage, Brussels Sprouts, Savoy, and Kohl Rabi should now be sown.

Immediately the seed is sown, cover over with some light litter. If this is neglected, failure is almost sure to result. When the seedlings are well through and are strong enough to bear the direct rays of the sun, part of the shading may be removed, and a little later on a dull or wet day it may be entirely taken away. Advantage should be taken of cloudy or wet weather for pricking out the young Celery plants from the seed boxes on to a well sheltered bed, and great care will be necessary if a hot day follows the operation, to afford some kind of shade for the

young plants, as they are very tender, and a few hours' exposure to the sun would be fatal.

Another sowing of French Beans may be made, and in warm districts Tomato may still be sown.

FLOWER GARDEN.

A number of varieties of Flower seeds may now be sown for Autumn flowering, including Aster, Balsam, Marigold, Nasturtium, Sunflower, Gaillardia, Coreopsis, Zinnia, etc.

Dahlias require attention, staking, and tying, and should be freely disbudded if fine flowers are required.

Phlox decussata (the perennial Phlox) should be well watered in dry weather. These plants will well repay any special care and attention devoted to them.

Cannas now coming into bloom will be benefited by frequent application of liquid manure.

If the soil is dry a previous soaking with water only should be given.

Cannas should not be allowed to remain on the same ground for more than one season, and should be taken up, divided, and replanted every Spring.

To keep them up to the mark these plants require high cultivation, without which they soon become weedy and unsightly.

The planting of all kinds of evergreen Ornamental Trees, Shrubs, and Fruit Trees should be done now where required, as the sooner they are well established before the dry weather sets in the better.

This is a good time for making grass Lawns, and advantage should be taken of cloudy and wet weather as much as possible for this work. The ground first of all should be thoroughly cleaned and levelled, and it is a good plan to allow the first crop of weeds to show through before planting the grass. If cleaned off before planting it will save a good deal of weeding afterwards. Artificial fertilizers of some kind are the best for this purpose, as other manures introduce an enormous quantity of weed seed. The best dressing

of artificial manure is a mixture of 2 parts Superphosphate, 1 part Guano, 1 part Bone Dust, and a little Lime. The quantity required is at the rate of about 4 cwt. for an acre.

Procure the grass roots, and plant in rows about 18 inches or 2 feet apart each

way. Press the soil well round the roots, and give a thorough good soaking with water can. If hot, dry weather succeeds, it will be necessary to shade with litter of some kind for a few days, but grass with seeds should not be used for this purpose.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of December, 1902.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).						
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902	Total for same per. from July 1st, 1901.	
	Maximum.	Minimum.					Fall.	Day.			
Estcourt	98	52	4.48	13	1.30	19th	11.65	15.13	
Nottingham Road	7.03	19	1.71	19th	18.55	21.68	
Adamshurst	97	51	3.93	16	1.5	26th	10.29	15.95	
Hulton	99	47	5.02	18	1.19	26th	12.85	18.71	
Mid Illovo, Ismont	98	53	5.36	12	1.02	15 h	18.81	27.33	
Ottawa	3.65	9	.93	20 h	17.52	22.01	
Mount Edgecombe	92	58	4.23	14	1.07	20h	18.65	26.12	
Cornubia	3.66	...	...	...	20.72	27.03	
Milkwood Kraal	2.80	...	...	...	13.72	10.99	
Blackburn	3.78	...	...	...	18.54	22.16	
Saccharine	3.70	...	...	...	18.58	25.14	
Prospect Hall...	3.52	...	...	...	16.25	17.70	
Clairmont	3.74	...	...	...	20.29	25.71	
Equeefa	102	62	5.57	13	1.40	15th	18.22	25.33	
Umzinto, Fencva	5.28	10	1.69	15th	18.29	27.11	

The Plant Enemies of Plants.

THE following paper was read before the Inanda Farmers' Association at Verulam, upon 17th December, 1902, by the Government Entomologist:—

Some time ago I endeavoured, in a few notes read before this Association, to introduce some of the general facts regarding the nature and class of insects, and, as most of my work in Natal has been connected with these and other pests of agriculture, I have ventured to-day to prepare some remarks upon what may be termed the "Plant-Enemies" of plants, to distinguish them from the numerous insect and other animal pests to the attack of which they are subject.

Whilst everyone knows to what I refer in speaking of a "plant," still it is not out of place to define a term so much used. In the ordinary sense it is applied to the smaller forms of vegetable life—

such as pot plants, hot-house plants, and garden plants, in contradistinction to the terms tree, shrub, herb, etc., but at the same time it applies to the whole Vegetable Kingdom, all the members of which are "plants." In this wider sense it is applied to and refers to organised living beings, devoid of the sense of feeling, and lacking the power of voluntary muscular motion.

The term "plant-enemy" I propose to restrict to such as are parasites; without dealing with cases where, by accident, rather than through following Nature's design, one plant exists to the detriment of another. The term will, therefore, refer to such plants as exist in or on other plants, and derive their nourishment from them,

Plants themselves may be arranged in two groups, and these are the "Flower-

ing" plants (Phanerogamia) and the "Flowerless" plants (Cryptogamia).

The latter group supplies the greater number and the most destructive of plant-enemies of plants, but a large number of flowering plants are also parasitic in habit.

Before proceeding any further with our subject one particular phenomenon of plant life requires consideration: that is the action of sunlight upon the special colouring matter of plants. This is comparable to the particular offices of the digestive organs of animals which prepare nutrient fluids, to sustain and build up the body, from more or less crude materials, *i.e.*, food. Chlorophyll is the name by which the common green pigment is known, and the special function of it and its other coloured equivalents is to convert into living or organic matter the inorganic substances, such as metals and salts (chemical manures) obtained by the roots from the soil. In this process carbon dioxide gas is absorbed from the atmosphere and oxygen given off, a condition of affairs the opposite to that which obtains among animals who inhale oxygen and exhale carbon dioxide.

Chlorophyll is not, however, present in every plant and where it is not present the plants lacking it cannot perform the phenomena mentioned and are dependent upon organic substance for existence.

These non-chlorophyllous plants, therefore, grow upon either living or dead organisms; that is, living plants or animals or their dead remains.

PARASITIC FLOWERING PLANTS.

Among flowering plants, there are in Natal several which are parasitic in habit. Of these mention may be made of the witchweed or isona of the mealie, the dodder of lucerne and the mistletoes found plentiful on native trees and often in abundance upon neglected fruit trees, particularly the orange and peach. Of these three parasites the dodder is characterised by the absence of green colouring matter or chlorophyll, whilst both the witchweed and mistletoe possess it. I have upon former occasions in my reports dealt with the parasitism of both dodder and witchweed and it will not be necessary to speak of it here. Some mention may, however, be made of the parasitism of the mistletoe.

In the fruit of this plant our feathered friends, the birds, find an attractive bait, and chiefly through their agency the pest is carried from tree to tree. In pecking off the rind of the fruit the bird usually discards the hard and unpalatable stone, but this is covered with a sticky coating which is sufficiently strong to glue it to the bark, should the bird have taken its meal upon a tree. Here it will germinate and send its root through the bark as far as the wood. Further than this it is, however, not strong enough to go; but as time goes on the point is sunken into the wood, the wood itself growing around it. The subsequent growing together of host and parasite differs with different kinds of mistletoes, each one of which requires special study. What actually happens is, however, quite analogous to that which is artificially produced by the nurseryman in grafting a scion on to a stock. All know that an orange scion can be grafted on to a lemon stock, and that the latter will provide for the growth of the former. If nature is allowed to take its course, a lemon tree, possessing a limb of orange wood, producing orange leaves and fruit, will result. But, if the lemon growth is suppressed, the orange limb can be formed into a tree whose root system is of the lemon.

In another respect the mistletoe also resembles an orange graft inasmuch that it does not act as a true parasite, for it only draws upon its host for inorganic supplies which it converts to the building up of its organic structure by its own assimilative functions.

Instances have occurred where mistletoe foliage has replaced that of the original plant, and illustrative of this, the case may be quoted of a *Sapindus* in the Durban Botanic Gardens whose life and growth is practically provided for by the mistletoe growing upon it. Concerning this particular plant, Mr. Medley Wood tells the story of a visitor to the Gardens who was so struck with the beauties of a tree labelled *Sapindus*—the mistletoe being then in full bloom—that he ordered plants for his own garden. Imagine his surprise on being told that the plumage of the particular tree he had in mind was all borrowed.

(To be continued.)



Photo by Editor.

Ploughing at Reichenau.

THE following is taken from the description by "Ergates" of the farming operations at the Trappist Station Reichenau; the article appeared in No. 7, Vol. V. :—

"Much of the ploughing is done by the Trappists themselves. Ploughing in wheat stubble were two brothers; their teams were horses, and each brother had three. The field was picturesquely situated in a river-bend; trees of varying shape and verdure fringed the river


boundary at intervals, and for the background there was the white stone village and its beautifully proportioned church; on the distant hill against the horizon was a cross. There was no shouting and no superfluity of labour; each brother silently guided his team by reins, and with even and automatic regularity were the furrows ploughed and the headlands turned. Without some effort of mind it seemed difficult to realise that I was in Natal.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 4th February next:—

Moss Dale.—Dark brown mare, white star and spot behind right shoulder, Imperial cast brand; dark brown gelding, small white star, branded on right shoulder R, and on left hip Imperial cast brand; iron grey gelding, shod all round, branded on left flank JH and Imperial cast brand.

Running on farm Heyden, Muller's Pass:—

Black ox, branded  SID

Running on farm Koenigsburg:—Roan mare and foal, branded R1 right hindquarter, long tail and mane.

The above animals are reported by the Natal Police, Muller's Pass, as too wild to be driven to the pound.

Thornybush.—Russian horse, branded with cast brand, and R on right shoulder. Impounded by Mr. Dinkleman, of Cato Ridge, on the 6th instant. Russian horse, branded with cast Government brand. Impounded by Mr. W. H. Myers, Harrison, on the 8th instant. Reported by Mr. J. Roberts, Manderston, on the 2nd instant, as too wild to be driven to the pound, two Madagascar oxen, one black with white face, one black-and-white, about eight years old.

Mooi River.—Running on the farm The Plains, Mooi River:—Red cow, tip off left

ear, right ear swallow tail, little white on udder, branded on off hind leg horse shoe, with red bull calf.

Inglebrook.—Light brown mare, no brands; grey mare, branded DU on right hind leg.

Meran.—Chestnut mare, white blaze, about 14 hands high, scar on off hind leg, wart on stomach, four white feet, old mark of sore on back, aged; black-and-white piebald mare, light coloured eyes, branded broad arrow near hind leg, heart upside down near shoulder, off front and near hind foot white, aged, about 15 hands; black mare, about 14 hands, white marks on back, about 5 years old; bay gelding, about 14 hands, small star on forehead, branded MB on off hind, and HO on near hind leg.

Pomeroy.—Merino ewe, F.V.; seven cross-bred Kafir sheep.

Running on the farm Freibourg, near Helpmakaar, and reported by Mr. A. Klingenberg as too wild to be driven to the Pound:—Black heifer, 4 years, little white on belly.

WG left flank.
U

Ndwedwe.—Dark bay (nearly black) pony, thick set, branded 7 on off side of neck, bushy mane, long tail, black points.

Nkandhla. — Running on the Mission Station, Italení. Quarantined through inoculation:—Red heifer.

Dundee.—Light bay gelding, branded off buttock KL, white blaze, and two white hind feet.

Running on the farm "Strathearn," and reported by Mr. A. L. Jansen:—Heifer, two years old, black with white spots, no brand, ear marks: right ear swallow-tail, half moon in front, left ear slit and half moon in front.

Howick. — Large black-and-white ox, branded MK on rump; large black-and-white ox, branded W on rump.

Running on the farm "Boschoek," and reported by Mr. G. F. Woodhouse:—Two-year-old red ox, branded M, two cuts in the left ear.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of December, 1902.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1902.					
Dec 1	Oranges	111 cases	Zanzibar	Secundra	Free of Pest.
" "	Seed Potatoes	426 baskets	France	"	" "
" "	" " " " " " " "	25 bags	"	"	" "
" "	Table Potatoes	400 baskets	"	"	" "
" "	" " " " " " " "	11 casks	"	"	" "
" 4	Tulip & "yacinth Bulbs	1 case	Southampton	Saxon	" "
" "	Potatoes, Table	1,111 cases	London	Duke of York	" "
" "	Grapes	161 barrels	Liverpool	Clan Macarthur	" "
" "	Seed Potatoes	60 cases	"	"	" "
" 6	Grapes	15 barrels	London	Inchanga	" "
" "	Potatoes, Table	80 cases	"	"	" "
" "	" " " " " " " "	45 casks	"	"	" "
" "	Potato Seed "	1,158 cases	"	Umtata	" "
" 9	Fruit Trees	1 case	Albany	Kent	" "
" 12	Oranges	399 cases	Naples	Kaiser	" "
" "	Lemons	331 "	"	"	" "
" "	Oranges	50 "	Liverpool	Dictator	" "
" "	Potatoes, Table	94 "	"	"	" "
" "	Oranges	50 "	"	"	" "
" "	Potatoes, Table	500 "	France	König	" "
" "	Apples	335 "	Albany	Moravian	" "
" "	Potatoes, Table	535 "	Liverpool	Clan Munroe	" "
" 13	" " " " " " " "	1,285 "	London	Umtali	" "
" "	Grapes	100 barrels	"	"	" "
" "	Seed Potatoes	280 cases	"	"	" "
" "	Ferns and Ornamental Plants	1 case	Dunedin	Kent	" "
" "	Rose Trees	2 cases	Hamburg	König	" "
" 16	Potatoes, Table	1,300 "	"	Eva	" "
" 24	" Seed	743 "	London	Illovo	" "
" 29	" " " " " " " "	1,500 "	Naples	Reichstag	" "
" "	Lemons	100 "	Sydney	Surrey	" "
" "	Oranges	50 "	"	"	" "
" 30	Potatoes, Seed	300 "	London	Afganistan	" "

C. B. JONES, Examining Officer.

Modern Methods in Tobacco Culture.

IN the *Australasian*, Mr. A. M. Howell writes:—I am now endeavouring to make clear the latest improved methods of curing by fire heat ordinary tobacco leaf. Let it be emphasised here that tobacco cannot be properly cured with any degree of certainty except in a room that is practically air-tight. Why not? I must be obvious to the thinking mind that both the heat and the relative humidity of the interior of the curing-room should be absolutely under the curer's control, and that such control is impossible except in a room from which the heat and the air cannot escape, except as the curer sees fit to permit it. The barn may be built of wood, brick, stone, or mud. It should be provided with a close, tight roof. A good material for this is rubberoid roofing, which is both air-tight and water-tight. There should be left no cracks or crevices anywhere. A window, with pivoted, close-fitting shutter, worked by cords, should be in each gable, near the top. Three or four like ventilators should be in the apex of the roof, the shutters to work by cords or wire, trap-door fashion, and they should work easily, but fit closely. There should be about four air-ducks through the walls at the ground level on each side of the barn of ordinary size. A series of round holes, these air-ducts, provided with turned, tapering, wooden plugs, for close stoppage, is a good means for letting in fresh air at the bottom when it is wanted. A door, about 5 feet wide, in either end of the barn will generally answer, but it is not a bad plan to have a door in both ends, looking to rapid work in filling and emptying the barn. Particular attention should be paid to their shutting tightly. The matter of making the barn as nearly as possible perfectly air-tight is of much greater importance in dry climates than in moist ones, and it may be regarded as of extreme importance in a windy climate, or at a windy time. The volume of air within the barn must be held, or let out and

renewed, or made moist or dry, at the will of the curer.

THE BEST BUILDING MATERIALS.

In Virginia and the Carolinas a curing barn, built of logs, about 10 inches in diameter, is regarded as fulfilling all requirements for skilful curing. Straight tree trunks of the required lengths are cut, and the body of the house is built of them pen-fashion, being first levelled of lumps, crooks, and knots with the adze, and notched down at the corners to make them lie closely upon each other. All cracks are closely chinked with clay mortar, and all other openings carefully closed up. The barn is not floored, but sits upon the naked earth. Frame barns are also common in some localities, but they are well weather-boarded outside and scaled inside, so as to make them close and retentive of heat and moisture. Whatever material will make a substantial curing-house having this necessary qualification will answer the purpose satisfactorily. Small barns that can be filled and fired the same day are preferred, looking to uniformity of colours. One furnace is sufficient for a small barn, but it is better to have two, if smaller, for a better distribution of the heat. Large, strongly-built heating-stoves are often used instead of furnaces, and with satisfactory results.

HARVESTING AND HANGING THE LEAF.

Among the many advantages that accrue to leaf-curing as against stalk-curing a few may be cited. In the first instance, curing will begin earlier—as soon as a few of the bottom leaves are ripe. It enables the harvesting and curing of ripe leaves only; and here let it be said with all possible emphasis that tobacco of excellent quality cannot be made out of green, immature leaf. A peach, apple, plum, pear, melon, or other fruit or vegetable is at its best in taste and flavour and aroma when it is fully ripe, and then only, and such is the case with

tobacco leaf. It then contains all that Nature had to put in it—its fullest content of the essential oils, in which reside the flavour and aromatic properties, and its maximum of mineral elements, as potassa, etc., which aids its burning qualities. Furthermore, in a ripe leaf, the chlorophyl—the green—of the leaf has undergone oxidation or chemical change, and is no longer a substance, bitter to the taste, and irritating to the mouth. A tobacco plant with all its leaves in this condition at the same time is never seen. If the top leaves are ripe enough, the bottom ones are over-ripe, and have lost much of their virtue, and are trashy, lifeless, and devoid of most of the qualities of a good smoke. Harvesting and curing green tobacco accounts for most of the disagreeable, biting, and flavourless qualities of the cheaper brands of tobacco sold in the shops. The farmer who cures ripe leaf only will always find ready sale for his leaf at from 25 to 50 per cent. advance on current market prices. The writer bases this assertion upon experience in Australia as well as in America. Leaf-harvesting should begin as soon as there are enough of the bottom leaves ripe to bother with—if only the half of a barnful. The leaves as picked by hand should be “spooned”—laid closely upon or into one another like a nest of spoons—and not allowed to dry or wilt, or lose any of their water until they have been hung in the barn and yellowed. A slide (or sled) is a very convenient vehicle for drawing the leaf from field to barn—being low and open. On this stack the leaves closely, and if it is hot or windy, keep the pile constantly covered with a tarpaulin or bags. Very little evaporation will take place in such case. Draw the barn, and stick and hang as already suggested, keeping the barn door and ventilator closed meanwhile. If the weather is hot and dry, sprinkle water over the floor to moisten the air in the barn. Do this at all times when the air of the barn becomes too dry. Stick the leaves on the wires about 1½ in. from the butts, through the mid rib, and push them up closely, the butts not quite or barely touching. A wire thus filled will carry six or seven heavy leaves, eight or nine

of medium size, and ten to twelve of small light ones. Hang as fast as stuck, and provide a moist, warm atmosphere. A gentle fire in the furnace or stove will maintain the proper degree of 88 to 90, not higher. Fill the barn in the quickest time possible, see that it is closed up tightly, and you are ready for

THE CURING PROCESS.

The temperature of the curing-room should be about 90 degs., and not over 95 degs., and should be kept as nearly as possible to the former degree until the leaf has assumed a beautiful golden yellow, which it will do in 24 to 36 hours, as a rule, if only ripe leaves have been gathered, and the proper conditions have been maintained. The yellowing stage is the first reached, and should not be permitted to proceed too far, else it cannot be checked until oxidation has gone to the point of darkening the colours into a greyish, perhaps dingy brown. The judgment of the curer is here required. Colours and shades cannot be well described in writing or print. The quick tactical eye catches the point when the proper shade is just coming in, and evaporation should be increased at once by opening one or two of the air ducts and one or two of the roof ventilators, and increasing the fire. These particulars apply to the production of bright leaf. The “lemon yellow” is the most fashionable colour. For very bright, whitish colours the drying heat and ventilation should be begun slightly earlier than where a deeper, richer yellow is desired. Fancy colours always bring fancy prices.

MAXIMUM RIPENESS.

When the leaf becomes yellow it is ripe—that is to say, dead ripe. It is then, in every sense, at its maximum of development, and on the verge of incipient decay. It is oxidising. Oxidation began when it commenced to ripen in the field, when it began to change in shade from a deep growing green to a paler pea-green. In the barn, up to the point we have reached, the oxidation has gone on with a constantly increasing depth of colour, until it has been checked

by evaporation—by starting a drying heat and giving sufficient ventilation. Allowed to proceed unhindered, it would go on to brown, to dark brown, and to black, and finally to rot, or putrefaction. In curing any class or type of tobacco, even cigar leaf, it is of paramount importance that it shall be properly yellowed as the first stage of curing.

DRYING THE RIPENED LEAF.

When the hanging leaf has reached the shade of yellow desired, the finishing stroke is to expel from it the water it contains in the shortest possible time. Heat cannot be applied with impunity, however. A too high temperature, when there is a large amount of water yet in the leaf, will redden it, and "splotch" it with red spots of irregular shape, and with scorched edges and tips. A too low degree of heat or insufficient ventilation will cause the face or upper side of the leaf, as it grew on the plant, to "sponge"—assume a smoky, spongy appearance. Nice judgment is required to "split the difference" between the two points of danger. Experience only can make one proficient in the art in this respect, but the studious, intelligent farmer will soon become a successful curer of any type of leaf if he is thoroughly in earnest. One or two failures to produce fine colours are great aids to future success, and in the meantime the tobacco turned out, though it be considerably discoloured, is good leaf—better and worth more in the market than that commonly cured by old-fashioned, primitive methods.

THE FINAL STAGES OF CURING.

So variable is tobacco leaf as it comes from the field in body, texture, size, content or gum, water, etc., that no hard-and-fast rule can be laid down as to how fast or how slowly the heat should be rushed. This important fact should not be forgotten or neglected, however, that the humidity of the air of the curing-room should be kept somewhat below the point of saturation, after the yellow stage has been passed. If the air becomes saturated from the escape of water from the tobacco, so-called sweat will appear at once on the walls of the barn, and the leaf will

be damp to the feel, if it does not show an actual deposit of water. This "sweat" is a deposit of dew from an atmosphere that is saturated, and it should be driven off instantly, on its first appearance, by an increase of heat and ventilation. Allowed to remain, it will cause spots on the leaf in a very short time.

When the leaf has been yellowed, we have in the barn a temperature of, say, 90 to 95. We now wish to dry out all the water that is on the leaf by gradual, progressive steps, avoiding extremes of heat and moisture. We increase the fire, lift several of the ventilators, and open a few air ducts at the ground, to increase evaporation—all with cool-headed reflection and judgment. Too much ventilation will reduce the heat; too little will increase humidity. Evaporation must go on, once the drying stage has been entered upon, and the question is, at what rate of speed? The outside weather has its influence, though far less in our barn than in an open, cracky one. If it is raining, the air we let into the barn is very moist. Heat reduces the percentage of moisture by expanding the air into larger volume. The remedy for too much moisture, therefore, is heat, with proper ventilation. These two agencies must work together reciprocally, and the things to be guarded against with care are the extremes of either. Whatever be the conditions prevailing, the deposit termed "sweat" must not be permitted to come near at this stage or afterwards.

Perhaps the best general rule that can be laid down is to proceed with the temperature by raising it at the rate of about 1 deg. an hour until we get up to 110 degs. Here it is best to rest until the tips and rims, or outer edges, of the leaf have begun to dry out without reddening or discolouration. We then go up with the heat at the same speed to 120 degs., and rest again until the web of the leaf is cured. When this stage is successfully reached the leaf may be regarded as safe from further danger as to colour. The heat may then be run up quite rapidly to 140 degs., or even to 150 degs., without injury to the tobacco. A temperature as high as 158 degs. has been found by scientific investigation to greatly injure,

if not hinder, the sweating power of the tobacco. In dry clear weather 140 degs. is high enough to go in leaf-curing. Much higher degrees are necessary in the stalk-curing method to secure colours, the sappy stalk feeding the inner parts of the leaf with moisture through the midrib after the web has been cured, causing discolouration until it is rapidly dried. The leaf is cured when every part of it is completely dry—when the midrib from butt to tip will break like a dry, dead twig on bending. Those who study the art of curing tobacco and adopt these advanced methods will soon learn when or under what circumstances the heat formula above generally recommended should be varied.

BULKING AND FERMENTATION.

One of the chief merits of the air-tight barn we have urged is the ease with which cured tobacco leaf can be brought to "order" in it. Close up the barn tightly, sprinkle the floor and lower walls freely with water, and start a gentle fire in furnace or stove. Vaporisation begins at once, the air in the barn becomes moist, the dry leaf absorbs the vapour, and becomes soft and pliable in a few hours. This cannot be done in an open barn or shed. In such structures there is often long, provoking delay, awaiting moist weather. Nor will leaf yellow properly in open house or shed at the beginning stage. Cured leaf is in proper order for handling when the web of it comes to about the consistency of a kid glove, and is not wet to the feel, and when the mid rib will bend without breaking half-way up from the tip. When thus conditioned the whole barnful should be taken down at once, and piled, before removal from the sticks—to avoid the absorption of more moisture, and to hold and equalise that which is in it. It should be piled closely, and covered well with tarpaulins, bags, or sheets. It is then rapidly stripped from the wires, and again piled evenly and closely covered. The next step is to tie it into "hands," about $\frac{3}{4}$ in. to 1 in. in diameter at the butts, either with a leaf or twine, and bulk down, lapping the hands upon each other, like shingles on a roof. The bulks should be made on a raised platform, and

built about 4 feet or 5 feet high, clear of the wall of the room, even and symmetrical, and should be at once well covered—literally wrapped up—with dressed tarpaulins or other impervious material. In proper condition for the sweat, or fermentation, tobacco leaf should contain from 20 to 24 per cent. of water—not more than the latter quantity. The moisture content may be approximated by weighing a handful of leaf, drying it thoroughly before a fire, and weighing again to ascertain the loss. The bulk should be only slightly weighted down, and should not lose any of its moisture if this can be prevented. The bulks should occupy a close room, and the sweat goes on more perfectly if the room is kept warm—say, about 80 degs. F.—and fairly moist. Heat, as from a hearth fire, and the sprinkling of water on the floor, bring about these conditions. So bulked and cared for, there will be no mold, the colours become fixed and stable, and the leaf is preserved pure and sound. In a month, or, perhaps, in three weeks, it will smell as sweet as a rose, and be in prime condition for baling and sending to market without further ordering. Three important points the inexperienced should keep well in mind:—1. Fancy colours cannot be produced in gummy, heavy leaf, grown in dark, rich soils. 2. Fancy colours, once caught and held, should be handled and bulked in as dry a state as possible, not to break or crack. 3. Leaf should be handled and bulked as soon as possible after it is cured to preserve the colour. If allowed to hang in the barn for any considerable time the colours will fade or deepen. Hanging cured leaf will become darker every time it gets moist and dries out again. Bulking will prevent this, and in three or four weeks the colour becomes permanently set.

Reports from England say that there have been a number of convictions in the courts recently for the sale of butter containing preservatives. One man was convicted for selling butter containing 63 grains of boracic acid to the pound, and another for selling butter containing 62 grains of the same substance to the pound. Yet another was fined for selling butter with only 17 grains of boracic acid to the pound.

Poultry for Utility Purposes.

By J. F. MARSHALL.

POULTRY keeping as an industry appears at the present moment a very important subject. Of late it has been a commonly accepted axiom that poultry will not pay if raised for utility purposes, and, as profit is essential to the success of any commercial business, and unless one can give good reasons demonstrating that profit can be made, it is scarcely possible this branch of the industry will receive attention. For poultry rearing, to be conducted on the same lines as it has been in the past, it certainly would be impossible to make it show a profit. It is my intention to show how, by starting with a few birds, a very substantial profit will be the result when run in connection with other farm businesses.

I have never seen or heard of a poultry farm run in England for the sole purpose of utility poultry by which the proprietor could make ends meet, not to mention the fortune which he expected making when he started. Many attempts have been made to establish large utility poultry farms, but they all show a long record of failures. A great number of these farms have been laid down at great cost, and energetic men have managed them; other farms have vanished like smoke through inexperience or bad management. It is here that I approach the farmers with the object of showing how the profit can be made which at the present time finds its way into foreign countries to the extent of very many thousands of pounds annually. Of course there are a few farmers in various parts who regard poultry-rearing as an important item of their work. These farmers are going in for the system of introducing new blood to their stock, primarily by purchasing pure bred cockerels. Where this was done last season some grand results have been obtained in the laying qualities of the fowls. In one case in particular I was informed that since introducing pure blood they are now very rarely without eggs. The eggs were also far larger, and

it was surprising how healthy and strong were the chicks when hatched. They also grow far quicker, the pullets coming on to lay a good two months earlier than when bred in the old manner. If the farmers would only give the suggestion of mating a pure bred cock with their common hens a trial we would not hear so much about their fowls being such bad layers and dying off. It is more often through lack of fresh blood than other causes that the stock has become so degenerated. True, some do purchase a fresh cockerel from their neighbours, which, in nine cases out of ten, is related in some way or other to their own stock, so matters are in this direction but little improved.

Careful observations show that far more fowls are now being kept than was hitherto the case, although, taking it on the whole, I cannot say that much improvement in quality has taken place, except, as I have stated before, where one or two energetic farmers are endeavouring to do all they possibly can to improve the poultry industry of this country. I think I shall not be far wrong if I say that in a few years' time still greater improvements will be seen, as now the country is getting more settled far more poultry shows will be held each year. These shows will do a great deal of good as far as laying qualities of fowls are concerned, because the more birds are bred for show standards the higher will be average of quality. Therefore, in the course of a few years, pure bred fowls will largely take the place of the common Kafir birds.

Farmers are apt to say that shows do no good for the poultry industry, as what is wanted is a greater abundance of eggs and fowls for eating. They do not look at the question in the right light, because, if there were no shows, there would be no direct incentive to breed good birds; indeed, no improvement would be likely to take place without the fancier. These

shows can do still greater things for the poultry industry by instituting classes for the best and most likely layers in the same way as conducted in England. Classes should also be provided for both live and dead poultry. In England the latter classes provide for the most useful breeds as well as various crosses, and are of great benefit to those interested. Far more has been learnt from these classes of dead poultry as to the relative value of birds for the table than would otherwise have been possible. In connection with the London, Smithfield, and Dairy Shows, thoroughly practical lectures have been given which have been a great source of benefit to the farmer. At the shows he can also find out which breed or cross

will be most suitable for his locality. Where one breed of fowls will do well on one farm, it is impossible to get anything like good results with the same kind at another. The Government experimental farm which is being started should be able to do much towards improving the poultry industry of the Colony. The experiments should help farmers to ascertain which breed will suit their requirements best. What is needed most is knowledge of more correct methods of keeping fowls on large farms, of the likeliest breeds for certain districts, and information as to improved methods for disposing of the eggs and stock.

(To be Continued.)

Cement and Cement Work on the Farm.

By WALDO BROWN, in the *Breeders' Gazette*.

A SUBSCRIBER writes: "How much floor will a barrel of cement lay for cows or horses?"

Portland cement is put up in barrels containing 380lb. net, while the cheap grades are usually put up 275 pounds to the barrel. A barrel of cement will make the concrete and give the finishing coat to 100 square feet for the floor in the cow stable, hog-house, or out-buildings. This calls for three inches of concrete and a half-inch of topping. My stable floors have been in use now over ten years, and there is not a flay or break in them anywhere; they show so little sign of wearing I believe they will last 100 years or more.

A perfect wall foundation for a barn can be made of cement. The plan for making it is to put up 2in. planks to form a mould; stake and brace them so they will not spring, then tamp in solid a concrete made with from eight to twelve parts of sand, crushed stone, and gravel, to one of cement. As soon as the moulds are filled to the top raise them, and add another section until the wall is built as high as desired, then plaster it on the outside and inside with a thin coat of cement to make it smooth and give it a finished

appearance. A wall 1ft. thick will be ample for any building, and if the barn is only a moderate-sized one I would make the wall but 8in. It will be stronger than any possible combination of stone and brick, and will be cheaper.

If you have crushed stone, angular, no piece larger than an inch in diameter, use eight parts of the crushed stone and four parts of fine, clean gravel from which you have screened the sand for mixing your finishing coat or topping, using a screen with quarter-inch meshes. This will make a wall as solid and lasting as granite, one that will last for generations. The mixing must be thorough. Build up a conical heap containing anywhere from twenty-five to fifty cubic feet, measuring the gravel, sand, and cement, and pouring them on alternately; then shovel it over four times, mixing it thoroughly; or perhaps a better way is for one man to use a shovel and another a fine-toothed rake, and as each shovelful is thrown on the heap pass the rake back and forth on it. This mixing should be done dry. When thoroughly mixed, shovel it over another time, having some one with a watering pot sprinkle as you do so. It should not

be wet enough to drip, but should be thoroughly dampened so that the cement will adhere to every pebble or bit of stone in it. As soon as ready wheel to the moulds, put in only a couple of inches at a time, and tamp with a pounder made 8in. square of 3in. hardwood plank with an upright handle; or there are metal tampers made which are better. There will be no need of waiting for it to dry, but the mould can be at once lifted up and a second section added.

I do not recommend, however, a wall of any kind for a basement barn, as it is much cheaper to make only the floor of cement, and where each post is to stand make the concrete deeper than at other points, then frame a basement and board it up with double boarding. This gives more room, as this will only occupy about 4in., while the wall will occupy from 8in. to 12in., and it gives as warm a barn as any one wants. Two years ago a barn in my immediate neighbourhood was built in this way, and though the mercury was several days many degrees below zero in each of the winters following, water never froze in the basement. It is easier also to fit your window and door frames in the board siding than into the cement. I cannot give an exact estimate of the cost of 100 square foot of wall, because the cost of the cement will depend to some extent on the distance it is shipped, as freight is quite an item; and the cost of the sand, gravel, and broken stone will also vary according to the distance it is hauled.

A correspondent writes: "I wish to build a barn of 40 by 70 feet, with nine-foot basement and sixteen-foot posts above. Will the floor you describe support the immense weight of such a barn and its contents, or will it be necessary to dig the usual trench and build up a good solid wall? I am also met with another difficulty. Only one corner of my location is on a general level, while the others are from twenty-four to twenty-six inches lower, making it necessary to make a fill from one inch to twenty-four. How shall I make this fill in order to have it solid enough to support the floor?"

There is no difficulty whatever about your foundation supporting the weight,

no matter how great it is. You would probably need to excavate a foot or possibly two feet where the posts are put in, but this excavation need not be more than fifteen or eighteen inches square under each post. For the rest of the floor simply excavate until you come to solid earth or hardpan and level it up to within six inches of where you wish the floor to be finished in the horse stable part, and three and one-half or four inches in the feed rooms and cow stables. I built a hog house thirty-two feet long two years ago, and the man who put in the foundation (which is a cement floor built as I recommend) by mistake made one end of it two inches short, and the man who framed it, taking my statement of the figures, thirty-two feet long, framed the building so the posts only caught on the edge of the floor two inches. I was so well satisfied, however, of the strength of the cement that we put up the house in this way, and we put 15,000 pounds weight on the floor the first season, and the same the past season, and it has stood it all right. As you will notice I say I prefer not to make a wall either of brick, stone, or cement, but to make a frame basement and double board the sides, putting the sills of the barn on top of the basement. Read what is said about this. As to your other difficulty it is simply a matter of grading. Before your floor is made draw in material—cinders from coal ashes, small broken stone, or small boulders, and level up to within the distance named above of where your floor is to be finished. See that these are all pounded down thoroughly, and then spread fine gravel over them, filling the cavities, and begin your concrete work on this. On the outside at the lower corner I would grade up with stone and gravel so that the horses can easily step up on the floor. I have laid a cement walk extending along the front of my barn from which we enter all of my stables, and I think it one of the best improvements I have ever made.

Agricultural Shows.

ESTCOURT, 3rd and 4th June, 1903.
E. E. Cautherley, Hon. Secretary.

Correspondence.

To the Editor Agricultural Journal.

THE CAROB TREE IN SOUTH AFRICA.

SIR,—In reference to your interesting and very useful account of the Carob tree and the possibility of cultivating it in Natal, allow me to state that when I was Home in 1889 I found the locust bean very much used by farmers there for feeding stock; and, as my farms in East Griqualand are in the yellow-wood belt, at an elevation of quite 4,000 feet, I thought I might cultivate that tree there with advantage.

I secured seed, and succeeded in raising some trees. At the same time I learned from one who was acquainted with the cultivation of that tree in the Eastern Province of the Cape, and had reared some trees himself, that they required a calcareous soil and did not thrive in the usual South African soils, which are so deficient in lime. Those trees that I raised lived for some time, but they did not thrive, and ultimately died off.

There is no doubt that the Carob is a most desirable tree to cultivate, if that can be done with success. But until we can marl our land as extensively as is the practice at Home, I fear little success will attend our efforts in its cultivation here.

There are many crops grown here, barley, for instance, and all the legumens that do not yield so well here as they do at Home, for this reason, they must have abundant lime. Our soil has not got that, and we cannot at present supply the deficiency in sufficient abundance.

The discovery of an abundant calcareous bed of this sort, that could be easily worked, would be the most fortunate geological discovery Natal could make, and a railway to the marl pits would be the most beneficial line Natal could then build.—Yours, etc.,

JAMES BONNAR.

Mount Partridge,

23rd December, 1902.

[Mr. Bonnar is correct in stating that the Carob requires a calcareous soil. Naturally, it grows in soil in which lime forms a large proportion. No one therefore need be afraid of giving his Carob trees too much lime. The minimum proportion under which success is attained has not been ascertained, and in practice should be avoided as far as the price of lime will allow.—T.R.S.]

MANURES AND SEEDS.

SIR,—If agriculture is to make headway in this Colony there are two matters which I would like to draw your attention to for the information of those carrying on farming operations, viz., the quality of manures sold, and more particularly the quality of seed put into the market and sold at high prices. Most of the latter is worthless. A law must be introduced, sooner or later, protecting the farmer from barefaced frauds, and I will endeavour to briefly illustrate the manner in which these things are done. Small seeds are sold without guarantee as to their quality. They may be good or bad. The buyer has to suffer, and has no redress in the event of the seeds not germinating; but I maintain there should be an Act protecting purchasers from fraudulent dealers who will sell old, useless seed which they have had in stock for a long time. The consequence is the farmer loses a season, is put to much expense and trouble, and reaps nothing for all his labour; and, when appeal is made to the dealer, he simply tells the purchaser that he gave no warranty or guarantee with the seed. I will place on record for the information of others my own limited experience, and leave others to judge for themselves how people are liable to be humbugged by unscrupulous dealers.

In August or September last there was a scarcity of seed potatoes. However, I happened to have a certain quantity of Early Rose myself (first year's seed from imported). I wanted some more, and

sent to Maritzburg for Early Rose, Colonial seed. The potatoes were supplied and invoiced as Early Rose. My gardener complained (saying that they were not good), but it was too late to send them back. These potatoes were a complete failure—instead of being Early Rose, they were mixed with a common white (known as White Elephants), and the remainder were bastards—seed which has become effete by the lapse of time (fourth or fifth planting). Now, Sir, what I complain of is this—such seed should not be put into the market. Whether the dealer is cognizant of the imposition, or the farmer who sells to the dealer, is a moot question; all I have to say is, that putting such seed on the market is absolutely a fraud, as it is difficult to detect. Anyone, with the most limited experience, knows that potatoes only bear three plantings, and the fourth planting becomes hybrid. If a farmer knowingly puts this seed into the market, then he is committing a fraudulent act by selling useless seed; and, to prevent such people trading on the public, a law of protection is required; and I sincerely hope to see such a measure some day one of the permanent laws of the Colony.

As regards the analysis of artificial manures, Messrs. Raw & Co. voice the sentiments of all practical farmers in the Colony. Protection is required to prevent spurious articles being put on the public, but I have found from my own small experimental beginnings that certain artificial manures suit different soils. Now, about here Fisons' manures are not so good, as the soil is varying and they have a burning tendency to root crops,

while Bone Meal and Basic Slag, with superphosphate in component parts, suits this soil well. Vitrolized bones are too heating and exhausting to the soil, but doubtless would, I think, suit damp ground in the upper districts. This is my experience, and I believe it would be a good thing for everyone to stick to the manure that is adapted to his soil.

Reverting again to potato seed, what I had myself from English and French seed produced a good crop, while the seed which came from one of the leading dealers in Maritzburg turned out an absolute failure—invoiced as Early Rose, but proving, to my disappointment, to be White Elephants. Manure, labour, and price of seed, over 20s. per bag, was simply thrown away, and yet the Government are thinking of introducing immigrants, of the poor farming class, to settle on the Coast on expropriated land. The immigrants would simply starve from the keen competition of the coolie farmer, who can live on 12s. 6d. per month at the outside. The best policy would be to pass a law for the protection of the poorer class of farmer they have at present in the Colony from fraudulent dealing in bad seed and bad manure. The dealer should be satisfied that he is selling a genuine article, and the seed the farmer disposes of to him should be guaranteed, and all imported seed should be subject to inspection. If some such precaution is not taken spurious seed is liable to be pawned off on the public, and farming in Natal will eventually be reduced to a decimal fraction.—I am, &c.,

MAGNUM BONUM.

December 31st, 1902.

Veterinary Departmental Report for November, 1902.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

HEREWITH I forward you my monthly report for November, together with those of the several District Veterinary Surgeons and Stock Inspectors:—

Scab.—This disease is still very prevalent in Natal, particularly south of the Tugela River. There are 70 flocks under license south of the river, and 22 north of Tugela River and Zululand. This disease, together with Mange, is the most

prevalent contagious disease in the Colony.

Lnngsickness.—This disease is abating in Klip River County and in Zululand. Ten fresh licenses only have been issued during the month in Klip River County, while a great number of herds have been declared clean and released from quarantine. Northern Natal is still an infected area on account of this disease, but cattle from the Upper Tugela Division are allowed to come south under special permit from me, and it is hoped that this privilege will be extended to the other Divisions of Klip River County at an early date.

Rinderpest.—This disease is prevalent in Zululand. Some districts have shown an improvement during the month, while in others the reverse has been the case. One fresh outbreak occurred in each of the Divisions of Klip River, Newcastle, and Umsinga during the month.

Glanders.—Twenty-four horses have been destroyed during the month for Glanders and Farcy. The different outbreaks are instantly taken in hand, and the danger of spread is not great. We are now cleaning up many of the cases left with us by imported horses, and the number of cases should now decrease.

Redwater.—Isolated cases of this disease have occurred in various parts of the Colony, and outbreaks have occurred among imported animals.

Quarter-evil.—Many cases of this disease have been reported.

The delay in sending in this report has been caused by my absence in Zululand and the New Territory.

S. B. WOOLLATT,
P.V. Surgeon.

P.V.S. Office, 24th December, 1902.

GREYTOWN.—D.V.S. CORDY.

Scab.—No fresh outbreaks. Only three flocks are now under license, one of which is very slightly affected.

Lungsickness.—An outbreak has occurred among a troop of 150 head, the property of Mr. J. C. Watt, of Newbrook, New Hanover. Two animals have died, and four others were sick when placed under license. Mr. R. Torlage, of Harte-

beeste Vlaakte, is still under license, but I hope to be able to raise the quarantine shortly.

Glanders.—None.

Rinderpest.—This disease was reported to have broken out in the Location near Middle Drift, Tugela, but, on investigation, was pleased to find it was only a false alarm. None is known to exist in the district at present.

Several cases of Gallsickness and Quarter-evil are reported from the Eastern Umvoti Division.

I have under treatment a very bad case of Purpura Haemorrhagica in the horse. All the limbs were tremendously swollen, also lips and lower portion of head. A very large swelling also existed under the abdomen. The animal has made such good progress that I feel confident he will now recover.

IXOPO.—D.V.S. POWER.

During the month I have done a great lot of work all over the district; in fact it has been a record month for work of all kinds with both cattle and horses. I have been four times to Polela, and castrated a good number of horses there and in Ixopo Division. All this travelling in districts like Ixopo and Polela, where no railway facilities exist, necessarily means a tremendous amount of riding and hard work.

As I say, a great variety of work cropped up, Redwater in imported stock giving most trouble. A Shorthorn bull belonging to Messrs. Archibald & Co., Highflats, has, I am glad to say, pulled through a pretty severe attack. At present I am treating an imported Devon bull belonging to Mr. R. Vause, Ixopo, and so far he is progressing satisfactorily, but in the early stages of this disease one has to be very careful before giving a favourable prognosis, as changes take place so suddenly. The young bull belonging to Mr. T. Foster, which I referred to in my last monthly report, has not, I regret to say, done well. He has been a most troublesome case, and has cost a lot of nursing, but still has taken relapse after relapse, and at this present moment is suffering from one of his pet attacks.

While on the subject, I must repeat what I said in last month's report re locally-bred cattle taking Redwater. Cases came under my notice recently of old cattle that were removed from a recognised Redwater locality, viz., Dronk Vlei to a part not far from Ixopo (which was never regarded as bad for Redwater), and contracted a virulent form of the disease at the latter place.

Glanders.—As per special report, one case of this disease showing clinical symptoms occurred in an old Military mare belonging to Mr. Mingay, Inglehook. I had her destroyed, and all the in-contact horses tested with Mallein, but none reacted. Farmers have been warned so often of the risk of buying horses from the Military that it seems almost unnecessary to again mention it.

Mange.—There has been a fair improvement in this disease latterly, and I think most people—not including Kafirs and coolies—now realise that this Mange is different and more difficult to treat than the disease which was known before the War.

Scab.—Slight improvement, but there are still too many flocks affected in Ixopo and Polela.

HOWICK.—D.V.S. SHARPE.

Scab.—This disease is still rather prevalent.

Lungsickness.—The two herds of cattle belonging to "Muti" and "Kokeye," Natives, near Boston, are still under license, but there have been no sick cattle for some time now.

Glanders.—None.

Rinderpest.—None. The quarantine at the Loteni has been raised.

General.—Shearing is now nearly completed, and wool is fetching considerably higher prices than it did last year. There have been several cases of vegetable poisoning among cattle. Mange is being vigorously attacked, and I have no doubt in the majority of cases it will succumb to energetic treatment.

DURBAN.—D.V.S. AMOS.

The importations of live stock for the month are as follows :—

Sheep.. .. .	4,928
Oxen.. .. .	3,870
Mules	500
Horses	132
Dogs.. .. .	21
Pigs	6
Cows.. .. .	5
Calves	4
Bulls	2
Total	9,470

The sheep all came from America, and included 2,000 breeding ewes. The oxen included 3,060 Madagascar oxen imported for repatriation and bile purposes. The mules were all American, and were of good quality. The horses included a good consignment of blood stock from America. The cows included two which came from the East Coast. The bulls were also of the same consignment. The animals closely resembled the Madagascar type, excepting they showed more quality. I understand these cattle have been sent down as a trial to their immunity to the local Redwater, and if they survive a large number can be offered for exportation.

Tuberculosis.—During the month a very nice English milch cow reacted to Tuberculin, and was destroyed. The *post-mortem* examination revealed definite lesions of the disease, thus confirming the test.

Glanders.—This disease, I am sorry to say, is very prevalent, and during the month I have destroyed six clinical cases and four animals that reacted to Mallein. In all cases *post-mortem* examination proved the presence of the disease. One outbreak is a serious one in a large trolley stable, and the work of testing all the animals is now in hand.

Lungsickness.—I am glad to report that only one centre of this disease exists in the district, and by the end of the present month I hope to be able to report freedom from this disease.

Horsesickness has made its unwelcome reappearance. I saw a typical pneumonic form of the disease on November 22nd. The animal was one out of a large stable of 150 horses, and the horse had been stabled up to the time of the disease developing.

Mange.—Several cases of this disease have been quarantined, and treated until free from the disease. I am of opinion this disease is less prevalent, but still demands attention. One thing is evident, the suppression of this disease is severely handicapped by the power of quarantining not being possessed by the District Veterinary Surgeon or Stock Inspector.

I have destroyed four dogs during the month, under the existing Rabies Restrictions, at the Port.

LADYSMITH.—D.V.S. NEIL.

Rinderpest.—There has been one fresh outbreak of Rinderpest amongst Native cattle in a mild form, in which one animal died and the remainder had no appearance of being sick. All the cattle were inoculated by the Government Inoculator, and up to date there has been no further outbreak amongst this herd. The inoculation has been very satisfactory at Wessel's Nek, and those who inoculated early lost comparatively very few animals. In reference to the outbreak at Doornkloof, there has been no further cases to report among Native cattle. At Weltervreden there still exists Rinderpest among Native cattle, where strict quarantine regulations are being carried out owing to the Natives having refused to inoculate a second time, and in order to stamp out the disease.

Glanders.—There have been two horses destroyed for Glanders-Farcy, and all the horses belonging to the Natives are inspected periodically.

Lungsickness.—One outbreak of Lungsickness has been reported among Native cattle, and these have been inoculated and placed under license.

The cattle in this district are looking healthy, and are improving in condition notwithstanding the prolonged drought.

NEWCASTLE.—D.V.S. HUTCHINSON

With reference to the outbreak of Rinderpest at Umsinga, Stock Inspector Walker is of opinion that the disease has been brought from Zululand. The outbreak in the Newcastle Division is near the Buffalo River, and I have been unable to trace the source of infection in this

case. Neither of these cases are of a serious nature. In the case of the Newcastle outbreak, the whole of the cattle in the vicinity of the infected herd have been inoculated.

Glanders.—This disease appears to be becoming somewhat less prevalent, and if owners will only take prompt action in reporting any suspicious symptoms shown by their horses, the disease would soon be eradicated in this district.

With the exception of Mange in goats, other contagious diseases are becoming less prevalent.

MOOI RIVER.—D.V.S. VERNEY.

Lungsickness.—In addition to Dr. Brewitt's cattle, another outbreak has occurred on Mr. Wright's farm The Alps, Rosetta. The outbreak was brought about by a number of cattle coming from Mr. Watt's, of the Noodsberg, the owner not being aware that these cattle were infected with the disease previous to their departure. The disease has a very firm hold in the herd, and, although the cattle are now inoculated, I am afraid there will be a considerable mortality before the disease is stamped out.

Rinderpest.—The quarantine restrictions have now been removed from the Umhlumba outbreak, which leaves Weenen County free from Rinderpest. Other cases have been of an ordinary nature.

MARITZBURG.—D.V.S. FYRTH.

Glanders.—Cases of this equine scourge are much less prevalent in the district than was the case recently. One horse was destroyed by me for Clinical Glanders, and, of seven in-contact animals, one reacted to Mallein test, and was destroyed.

Lungsickness.—There are no cases of Lungsickness in either the Umgeni, City, or Upper Umkomanzi Division.

Scab.—No cases.

Rinderpest.—No cases.

General.—With the exception of a few cases of Equine Mange, which are isolated and being treated, there is nothing to report in the City, Umgeni, and Upper Umkomanzi Divisions.

Average Milk Yields.

IN the *Australasian*, "Talpa" writes : —Whatever breed may be chosen or preferred, the average annual yield of the herd should reach a certain standard. A few years ago 300 gallons of milk per cow was considered a large return from a pure-bred dairy herd, but nowadays two or three times that quantity is not phenomenal, and much larger records have been made ; at least, by individual cows. Some ambitious breeders are even now striving for yearly records that can only be written in four figures. Generally speaking, however, a cow that gives 500 gallons per annum is the wonder of the neighbourhood ; but twice that amount does not now astonish advanced dairymen, and much larger yields are well authenticated in New South Wales dairy herds. These facts convey some idea of the possibilities within the reach of breeders of dairy stock. One can hardly grasp the magnitude of the undeveloped

resources of the dairy cow. By judicious management, intelligent breeding, feeding, and care the annual average product of the cows of Australia might be doubled without adding anything to the cost of producing the milk. A 300-gallon cow eats about the same quantity of food and incurs the same amount of labour and attention as the cow which gives 600 gallons per annum. What, then, is the use of keeping inferior cows ? In all branches of agriculture, old methods and old machinery have been replaced during recent years by new and improved systems and appliances for working, giving a larger return for the labour and expense involved, and similar improvement is possible in the breeding of dairy cows—the sort which convert the crops of the farm into milk, butter, and cheese at a minimum of expense, and with the greatest profit to their owner.

Dog Stories.

THE means by which animals contrive to communicate their ideas to each other is, says a correspondent of the *Live Stock Journal*, a phenomenon which puzzles the keenest observer of their habits. That they can, and do, make known their wants to each other is pretty evident, as the two following instances will show. A gentleman was in the habit of journeying to London on horseback occasionally, accompanied by a favourite little terrier, which he used to leave at an inn in St. Albans till he returned from London. On one occasion, when calling for his dog, the landlady told him it was lost ; it had quarrelled with the house dog and had got the worst of it, and it was thought would not recover from the injuries received. After a few days, however, the terrier was observed to crawl

out of the yard, and no one saw him for nearly a week, when he returned to the hotel with another dog more mighty than his enemy, on whom they both fell and nearly killed. The little terrier had actually travelled to his home at Whitmore, Staffs., and obtained the assistance of a strong ally to resent the injuries he had received from the St. Albans hotel dog. A Leeds surgeon found a lame spaniel, which he carried home, dressed and bandaged the injured limb, and in two or three days turned him loose. After an interval of several months the spaniel presented himself at the surgeon's home accompanied by another dog, which was suffering from lameness, and the old patient intimated by piteous and intelligent looks that he desired his friend to receive the same kind treatment from the

doctor's hands. The sagacity of this spaniel must have been marvellous, seeing that he remembered his own injury, that he was cured at that particular place, and clearly thought that what had been

done to himself could be done to another dog. It will probably be found that it is the extraordinary tenacious memory of the animals to which these remarkable performances are to be attributed.

Milk Adulteration.

AN ingenious method of milk adulteration practised in Athens is described in a Greek publication. The residents have a penchant for goats' milk, and herds of these animals are led along the streets by milk-sellers wearing long blouses with capacious sleeves. Their cry of "Gala! Gala!" brings the housewife to the door, and she prudently demands that the goats shall be milked in her presence. This is done, but the milkman has in one hand the end of a thin tube which runs up his sleeve, and connects with an indiarubber receptacle full of water which is carried under his ample blouse. At each pressure of the fingers on the udder there is a corresponding compression of the water sack, and

milk and water flow side by side into the receiving vessel. A somewhat similar swindle has been perpetrated in Victoria on more than one occasion by exhibitors of cows entered for the butter test at shows. At Wangaratta some years ago, a man engaged in milking one of the competing cows was found to have a baby's feeding bottle full of cream up his sleeve, while at the recent show of the Royal Agricultural Society a syringe loaded with cream was found in the portion of the show-grounds where the butter-prize cows were being milked. This indicates that we are fully up to the Greek standard in some kinds of enterprise.—*Australasian*.

Tick Fever.

IT has frequently been remarked, says "Shorthorn" in the *Queenslander*, that the more we learn about ticks and tick fever, the less we seem to know about them. Judging from some of the American papers to hand, in which the subject has been somewhat extensively discussed of late, there would appear to be some truth in the above paradox. It has, up to the present, been the general opinion among practical men, founded to a certain extent on observation, but largely from the teachings of scientific investigators, that ticks are most numerous and their effects on cattle most virulent during seasons when the atmosphere is warm and humid. It may safely be said that during the present winter season, and in the midst of a very severe drought, the

ticks in Southern Queensland have been more numerous, and their virulence greater than in any previous period, and the mortality from tick fever greater than during any time since their appearance in the South.

The same vagary in the action of the ticks would appear to have been observed in America. Some valuable stud cattle sent from north of the tick line in America to a Charleston Exposition south of the line in the winter season contracted tick fever, and a very large percentage of them died. It is also found there that some sections of the Southern States, and some parts of the same county, and even parts of the same farm, remain free from ticks. In one instance a stockowner states that he had two pastures, only a mile apart, on

one of which imported cattle are as safe as in country north of the tick line, while on the other northern cattle succumb to tick fever.

Last year was a wet season in Alabama, and ticks were hardly noticeable; while in dry seasons cattle become so thoroughly covered with ticks that they lose flesh and many die. The deaths from Texas fever in Madison county are more numerous than in wet seasons. Cultivation of a field, no matter how grossly infested will thoroughly rid it of ticks in America. Probably the same may have been observed here. It seems of little use to

dogmatise on the subject of ticks or tick fever. Blood taken from an animal suffering from, or that has passed through, a most virulent form of tick fever, has been found to produce no effect when injected into unprotected cattle; while, on the other hand, blood from an inoculated beast that never reacted to the inoculation, has frequently been found so severe as to cause a large percentage of deaths in the cattle inoculated with it. In one thing the American and Australian experience is at one - namely, that the fever is caused by ticks in an early stage of their life.

Paspalum Dilatatum.

MR. W. SECCOMBE, of Central Bucca, writes to *Station, Farm, and Dairy* :—"As I am growing *Paspalum* on a large scale and sell tons of seed, I feel that I am competent to give a few hints that may be of benefit to your farmers and district generally. I think planting from seed much the quicker and most satisfactory method for good results. The way we do on our scrub lands is—burn about January or February, and immediately the ash is cool, sow about 10lbs. of handshaken seed per acre. This makes an excellent coat of grass, and comes in nicely for winter feed. A neighbour of mine, back 2½ years ago, sowed a paddock this way on the 1st January, and at the end of the following March and April pulled seed for market. I have had it seed in the same manner myself but not heavy enough to pay to strip. To sow on ploughed ground, the land should be worked well, 10lbs. of handshaken seed sown per acre, and then lightly rolled. To sow on old pastures, sow about 5lbs. of handshaken seed per acre, and harrow well, if possible. People in some parts have become afraid of sowing seed through having been 'had' so often with bad seed. I would strongly urge farmers to ask for best handshaken when buying, and see that they get it. A simple method to tell good seed is to take a pinch between finger and thumb, place it between the front teeth and bite it. If it will crack it will grow, but if like chewing chaff, send it back. All the dairying

lands on the Tweed and Richmond, a great lot on the Clarence, Orara, Bellinger, and The Macleay, Manning and Hastings are under *Paspalum* grass, and South Coast people are beginning to purchase seed and roots largely. I hope in another few years to see all the Commonwealth's pastures under this grand grass. We find it unrivalled for butter and milk production. The hay is tiptop. The best times to sow are August and September for summer feed, and January February and March for winter. It seems to flourish on any sort of soil, and will stand months more drought than other herbage. We have proved that here in this most trying of seasons."

When a bull has once attacked his keeper (says the "Agricultural World") he should be housed and another man put to attend him. A good plan is to tie up the animal for a month, and get the new keeper to brush him regularly and feed him well. Every time he goes to him he should give him a bit of cake or a carrot from the hand. In a month or so he will come to know him and appreciate his visits. It is better not to take him out for a month; and when he is taken out men must lead him, one with a leader and the other with a rope; a boy with a sharp whip must drive. Walk him sharply for half a mile; do not allow him to stop or set his neck; the boy will give him a little tip when he is inclined to stop. Exercise him once a day in this way, and allow him to show no fight, and he will give it up; after a few months of this treatment he will have become so subdued that one man can lead him.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	W. Couch ...	Okehampton.
J. Button ..	Estcourt, South of Bushman's River	"	H. E. Kirby ...	Klipfontein
		"	P. Ballantyne ...	Weston Town Lands.
		"	B. Garland ...	Mount Victoria.
		"	C. Acutt ...	Connington.
		"	J. Mattison ...	Klipstone.
		"	Wood Bros. ...	Stockton.
		"	A. Kruger ...	Twyfelfontein.
		"	B. W. Hall ...	Gleniffer.
		"	L. Berthon ...	Littlecote.
		"	H. K. Miller ...	Zaailaager
		"	D. W. Scheepers ...	Moord Spruit
		"	J. E. 'ates ...	Evansdale.
		Lungsickness	J. B. Brewitt ...	Wagon Drift.
		"	R. R. Wright ...	The Alps.
J. J. Hodson ...	Lion's River ...	Scab	A. Sinclair ...	Craigdarroch.
		"	J. Ross ...	Gowrie.
		"	D. C. McKenzie ...	Lion's Bush.
		"	D. Connell ...	Vlaak Laagte.
K. Soutar ...	Portion of Lion's River	"	C. J. Smythe ...	Stratherne.
		"	J. Chadwick ...	Howard.
R. Vause ...	Ixopo ...	"	Dambuza ...	Claybrooke
		"	R. Mearns ...	Springbrook.
		"	Shelana ...	Mackensie.
		"	J. P. Vause ...	Thorninghurst.
		"	Inegwa ...	Columbia.
		"	D. Hulley ...	Eastwolds.
		"	C. D. Eva ...	Dronkvlei.
		"	Ikonyela ...	Springvale.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
R. J. Raw ...	Impendhle ...	Scab	Mahandan ...	Loteni.
		"	B. Ogram ...	Tilletudleni.
		"	B. Gresham ...	Cattle Howard.
		"	W. Harrington ...	Bentwood and The Rest.
		"	S. Faber ...	Virginia.
		"	H. Hill ...	Coquidale.
		"	T. D. Catchpole ...	Essex.
		"	Nomandindi ...	Impendhle Location.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
W. Wilson ...	Ipolela ...	"	J. Alcock ...	Mossbank.
		"	J. Hayes ...	Glengariff.
		"	Uzieza ...	Location
		"	A. C. Thurston ...	The Rocks.

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
W. Wilson ...	Ipolela ...	Scab	R.M. & D. Arbuckle J. Morrison ... Earnshaw & Hilton C. A. Phipson ...	Costmore. Glenmar. Pierremoot. Strath Campbell.
G. N. Perfect ...	Umvoti, East ...	"	P. & H. Mare ... Thos. Hill ...	Speculation Stolzenvols.
A. S. Parkinson ...	New Hanover ...	Lungsickness	J. C. Watt ...	Newbrook
E. Varty ...	Umvoti, West	Scab	J. G. Nel ...	Elladale.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 88 herds of cattle under license for Lungsickness, and 19 flocks of sheep under license for Scab as under :—

Natal—Newcastle Division	...	...	...	4 for Lungsickness, 2 for Scab
Klip River	"	...	30	10 "
Dundee	"	...	5	6 "
Umsinga	"	...	1	— "
Upper Tugela (North of Tugela River) Division	...	...	—	— "
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	21	— "
Nkandhla and Nqutu Districts...	...	...	21	1 "
North of White Umfolosi and Umfolosi Rivers	...	...	6	— "
Total	...	...	88	19

The following farms are in quarantine for rinderpest :—

Newcastle Division.—Vlaaklaagte.

Ladysmith Division.—Doornkloof, Wessels' Nek, Weltevreden, Brakfontein, and Modder Spruit.

Lower Tugela Division.—Francesco (cattle of Natives).

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District.

Umsinga Division.—Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 7th January, 1903.

India Rubber in Tongaland.

THE following suggestions with regard to the development of an India Rubber industry in Amatongaland have been submitted to Government by Mr. T. R. Sim, Conservator of Forests :—

From the report of the Tongaland Rubber Commission, 1901, taken in connection with the identifications by Mr. J. M. Wood of specimens secured by that Commission, it appears that the wooded portions of Tongaland and part of Ubombo District contain a considerable amount of a species of *Landolphia* ("Ibungu") yielding Rubber, and that

that species is generally distributed there wherever there are trees on which it can climb; its monkey-rope habit absolutely requiring the support of other trees. Its specific identification is not complete, but it is probable *L. Kirkii* Dyer, the species from which the rubber of the East Coast is mostly obtained, which has during some recent years been exported to the value of £200,000 per annum.

There are several species of *Landolphia* at Zanzibar; Madagascar Rubber (*Vahy*) is produced by *Landolphia* species (of which two have been described as *Vahea*

Madagascariensis, Bojer, and *V. gummi-fera*, Lam.); while the West African Rubber was till 1895 mostly, and is still largely, produced by species of *Landolphia*, particularly *L. owariensis*, though several other species contribute a share, the yearly export from the Gold Coast, which began about 1882, being in 1893 of the value of £218,162, and almost 2,000 tons weight.

From *Landolphia* there was thus produced almost all the African Rubber up till 1895, when *Kickxia Africana*, Benth, was found to yield a valuable supply, of which, within one year of its discovery, 2 263 tons were exported, of the value of £269,892 13s. 10d., from Lagos.

All these plants belong to the same natural Order, Apocynaceae, which has other, though possibly less valuable, rubber producers, including *Holarrhena*, of Central, East, and West Africa, as well as the *Tabernaemontana* ("Mkahlu"), collected by the Tongaland Commission.

Almost all the African Rubber is produced by that Order, except a little from *Ficus Vogelii*, Miq. from Lagos and neighbourhood, and some from cultivated plants of *Ficus elastica* grown in the Island of St. Thomas.

Most of the Malayan and Asiatic Rubber is also from Apocynaceae except that from *Ficus elastica*, and from cultivated American Euphorbiaceous kinds, while some Demerara Rubber from *Forsteronia gracilis*, and Jamaica Rubber from *F. floribunda*, are also from that Order.

Some African Euphorbiaceae produce milky juice which hardens, but has not hitherto been converted into commercial rubber; but the American Para Rubber (*Hevea Brasiliensis*), the Nicaragua Rubber (*Castilloa elastica*), the Cereia Rubber of Brazil (*Manihot Glaziovii*), the Colombian India Rubber (*Hevea biglandulosum*) and British Guiana Rubber (*Hevea spruciana*) are all products of tropical American Euphorbiaceae; and several of these are being experimentally cultivated in India and Ceylon, as well as in tropical Africa.

Many of the species of *Ficus* yield rubber, including most of these now cul-

tivated as shade trees in Natal, though the conditions of labour and the smallness of the flow of milk in these has hitherto prevented even experimental tapping of what might be found valuable kinds in more tropical districts, where the flow of sap during rainy times is greater and the labour problem less difficult. The Assam Rubber is the product of *Ficus elastica*, but it must be noted in connection with this species that though it is cultivated as an ornamental tree in Natal as well as almost everywhere within the tropics, it is only in the excessively wet portions of Assam, Java, and St. Thomas Island that commercial rubber has been produced from it, the flow of sap being insufficient for trade purposes in less moist localities, and also during the drier seasons, even in the above-mentioned countries.

So far as may be deducted from natural relationship, there is no reason why commercial rubber should not be produced by the plants collected by the Tongaland Commission, but the evidence adduced by the Commission gives no indication whatever as to whether the flow of sap or the conditions of the country would allow of its profitable exploitation.

The whole subject hangs on the labour supply, its cost, and its method of application; the rubber is there, but can only be profitably exploited if the cost of labour and supervision will allow it to be marketed in fair competition with other rubbers; while the value of Tongaland as a rubber-field depends altogether on whether the rubber is cropped methodically, or the vines and trees rapidly and completely ruined by the adoption of destructive methods.

There is little precedent to follow since almost all rubbers, or at least all African Rubbers, are produced in uncivilized countries, and by barbarous methods, under which present revenue rather than permanent maintenance of the crop is considered.

To give an uncontrolled time concession over the rubber simply means that the best of the vines would be completely destroyed within that time, without any adequate cash return, without the establishment of a permanent industry, and with no prospect that the forests there

would ever regain their present value. To encourage the natives to collect and trade in rubber without strict supervision would be even worse.

To give any concession under close Government control requires the establishment of a conservation staff, and there is no assurance at present that the industry would pay for the necessary force.

There is so much still uncertain with regard to the industry—much of which can only be ascertained by experiment and observation on the spot—while the value appears to be considerable and may be easily frittered away, that I would advise cautions but early procedure on the part of Government with respect to it.

A reliable forester placed in Tongaland, and allowed sufficient labour, would in one or two seasons clear up much that is now doubtful, and could at the same time patrol certain areas in his neighbourhood which might be opened on licence for tapping by the public.

His station would also be a test plantation where the cultivation of indigenous and exotic rubbers could be tried.

Several applicants for employment have taken part in rubber collection in other parts of the world, and have expressed willingness to undertake such duties in the fever districts of Zululand.

The Commission reports that the best rubber district, being waterless, is uninhabited by natives, and I consider it useless and expensive to rely on local free labour, and would suggest that either indentured Coolies be used, or that a small convict station be established and convict labour utilised, water being most probably obtainable by sinking in the sandy soil. Coolies are the better, as they can be more freely distributed in the collection of indigenous rubber, though in the formation of a test plantation, convicts are as good.

I would propose that such a forest station be established in the neighbourhood of the Pongola River, for two years in the first instance, the forester to be engaged for that time, on wages at the rate of £250 a year—he to provide himself with such house accommodation and means of transport as he may require for

his work, but to be allowed transport expenditure to the station, and also from it if he be not retained there at an equal or higher wage on the expiration of the two years.

To take full advantage of such an officer, I propose supplying him with 20 indentured Indians, and he would act directly under my instructions, both as to the extraction of latex, the formation of a test plantation, and the carrying out of the many experiments required.

Rubber collected would probably meet the whole or a considerable portion of the cost of the establishment. (Any concessionaire would expect returns to do more than meet costs, including rent or price, but would probably do much more damage even though under regulations and supervision, while the class of labour employed by him would naturally be of his own selection.)

A Forest Station, established as above, I would estimate to cost for the two years :—

Forester, 2 years at £250 per annum	...	£500
Transport charges to and from his station	...	
for himself and 20 Coolies	...	100
20 Coolies at 10s. per month for 2 years	...	240
Food for the same	...	300
Inspection and incidental expenses (tools, boxes, etc.)	...	160
Total (for 2 years)	...	£1,300

Probable Revenue (allowing an average of 2½ lbs. of latex, dry, per Coolie per working day) :—

13 tons Rubber, at £100 per ton, there .. £1,300

The quantity that can be collected per man per day is altogether uncertain, but the price may be twice that estimated if sufficiently high quality is obtained. What area is required to produce 18 tons is also uncertain.

From the Commission's Report I would estimate the whole of the Rubber area at about 300 square miles, not including the inhabited central grassland of Tongaland.

If the vines can be tapped every second year then 150 square miles per annum are available for tapping, but as that is uncertain I consider it better in the first instance to leave a wide margin, and assume that 30 square miles could be used annually. This would allow time for recovery even if the larger vines are

damaged by the bleeding, and would, in its scattered form, be a reasonable area for a Forester's patrol, if his station were centrally placed in it, the Forest Station in that case having to be moved every year, or at least as often as a section is finished. On that account I recommend temporary rather than permanent buildings.

After the station has been working a few months and sufficient information collected as to produce per acre, the question of opening a section not exceeding 30 square miles in area, for working by the public under licence might be considered. As the whole country is not of equal rubber value a tariff per acre does not meet the case, though that is also required to prevent roaming.

I would recommend an equal prepaid license per acre everywhere (to be fixed after value is ascertained), supplemented by a further license per 100 pounds weight, to remove the rubber, the latter to be paid when the cases are stamped by the Forester as ready for export, and permit for removal given; and the export of rubber should be totally prohibited except under such removal license.

Such double license would make the more valuable forests yield revenue in proportion to their value.

Tapping licenses should be available for one month only, but might be renewed month by month. Removal licenses should be issued only within one month of the termination of the tapping license, but not necessarily for immediate removal, stamped cases being allowed to remain stored till opportunity for removal occurs; but the possession of unstamped rubber beyond the period specified above should be punishable.

Any concession or license based on time alone is very highly objectionable; and there is no excuse whatever for granting ground rights with any form of permission. The method adopted in some countries of binding concessionaires or licensees to plant two trees for every one either intentionally or inadvertently destroyed is theoretically good, but in practice, with ordinary human nature, it is quite unworkable, and the prevention of damage can only be regulated by a penal clause in the regulations, and by cancel-

lation of existing licenses, and refusal to grant more.

If the scheme sketched above, both for a Forest Station and for an open section, be approved in principle, I will draft regulations and licenses applicable to the case.

Funds would also have to be provided as the available votes are meantime otherwise required.

CULTURE.

Thus far, only indigenous rubbers, in their natural condition have been considered, but it may be found on inspection that the area and value of the Rubber field can be vastly increased by cultural methods. Present information leads to the belief that by far the greater part of the bulk of Tongaland Rubber, and the only which has an ascertained value, is produced by *Landolphia*, which occurs also through the Portuguese Territories and Mashonaland. In habit it is a vine or monkey-rope, growing in open forests, and hanging in festoons over the tallest trees. The trees are indispensable to its successful growth; the maintenance of the virgin forest, therefore, is an essential part of any cultural treatment that may be adopted with it. It is possible that the number of vines throughout the forest may be enormously increased by artificial means: the seeds are several in each fruit, and about the same size as oats, but more flattened, and their culture is meantime altogether unknown. Two *Landolphias*—*L. Kirkii* and *L. Florida*, are each represented by a single specimen in the Durban Botanic Garden, planted in 1892; both are healthy, vigorous, straggling creepers, not yet having reached the liane stage; but it is evident they will grow there, though the natural southern limit, at least in quantity, of the "*Ibungu*" is said to be the Mkuzi River. That fact should be kept in mind, since the whole of the Tongaland rubber-field is on the outer margin of the *Landolphia* region, and in such circumstances the flow of latex as well as the number of vines has a tendency to taper off.

Except by increasing the number of vines in the natural forests, or planting them in forests where they are meantime absent, I do not see that any cultivation of *Landolphia* can be successful; and increasing the flow of latex by pruning and

training, as proposed by the Commission, appears to me to be commercially impracticable, as well as illogical; however that is a subject for experiment.

Cultivation of *Landolphia* in open country gives no prospect whatever of success.

The "Mkahlu" (*Tabernaemontana* sp.) is a small tree, not uncommon in Natal and might lend itself to ordinary forestal cultivation, but the points for inquiry regarding it are whether its rubber, taken alone, has any value, and whether its rough bark will allow the collection of the rubber. The fact that it is occasionally tapped for making birdlime proves nothing regarding its rubber, for many *Euphorbiae* are so used, and bled freely, but have proved unworkable for rubber.

The "Mfuba" as a *Ficus* would be easily cultivated in any sparsely-forested district of Tongaland, where sufficient root moisture is available, and might even be extended into open swamps with great benefit to the climate. The Commission report its resemblance to the "Mpai" trees of Durban, which are also a *Ficus* species yielding rubber, and which might be worth introduction on ground too dry for the indigenous species.

Ficus elastica, the Assam Rubber might also be planted out as an experiment; its growth is good on the Natal Coast; its seeds can be obtained at trifling cost from the Assam Forest Department; and the only question is whether it will here yield a sufficient flow of latex, its natural habitat being more tropical, and having a rainfall of 100 inches per annum.

Of exotics the most promising is Ceara Rubber (*Manihot Glaziovii*) from Brazil, which grows in hot arid regions and might be very successful in the central belt of Tongaland. There are several trees of it in the Durban Botanic Garden, and cuttings and seeds could be obtained from there for a start, the trees having begun to seed when only a few years old. It is a small tree of open habit, and if widely spaced might be grown throughout the mealie lands of the Amatonga without interfering with the mealie crop. Its culture in other parts of Zululand is also worth consideration.

Para Rubber (*Hevea Braziliensis*) has been cultivated in Ceylon and in the Cameroons, but its success in Tongaland is doubtful.

Almost all other Rubbers are from the moist tropical forests near the equator, and the prospect of success with them is very small.

But, as pointed out by the Commission there are many subtropical cultures which might be successfully introduced there though not likely to succeed elsewhere in Natal, and these should also receive attention at the Forest Station, while for the introduction of such products a coast nursery attached to a forest station near Durban would also be a great benefit; not so much a botanic garden as a test plantation and nursery for such special exotics as may be selected.

Inquiries have been made as to whether Government is prepared to grant or dispose of land for the Cultivation of Rubber by private individuals or companies. So long as the ground selected is not Forest ground that lies outside my province, but I consider that meantime all Crown Forests should be maintained intact, and only worked for rubber on monthly licences as detailed above, and one section completely finished before another is opened, the first being then allowed to rest undisturbed for as many years as may be found to be necessary.

If, however, open land is acquired, and planted in Rubber of any kind, the product of that would be private property and special arrangements would have to be made to allow its free removal.

The method of collecting rubber, practised by the East Coast Natives, is condemned by the Commission without anything better being proposed.

As the latex exists in the middle bark rather than in the lower bark or cambium, it is only half through the bark that tapping requires to be performed. I have no information as to tapping in other countries but am aware that in some a spoke-shave set like a plane is used to prevent too deep tapping. I would suggest that such numbers of the *Indian Rubber Journal* as are obtainable, be added to the Departmental Library, as probably methods in use would be found there.

In some cases the bark is completely removed, chopped up, and boiled, but the latex thus obtained is dirty and of low value, while the vines are ruined until new growth has matured again which may be in twenty or more years, and this

method appears to be worth prohibition, as also is the extraction of root rubber.

The method of treating the rubber after extraction differs with each kind, though in several the latex is simply allowed to dry naturally on the tree.

In a circular issued by the Lagor Government, September 30th, 1890, when seed of *Ficus elastica* was imported from Assam, occurs this, "The preparation of the Coutchouc is similar to that of the Rubber of the *Landolphia owariensis* of West Africa. Such of the milk as flows freely is coagulated by boiling, but the greater part is allowed to dry on the tree, from which it is stripped when sufficiently evaporated to bear handling."

I recommend that several trees of the "Mpai" *Ficus* in Durban be selected and tried there by the Government Analyst, with a view to ascertaining the comparative value of different methods of tapping that species and treating its juice; by analogy the same methods might be expected to succeed if applied to the "Mfuba" of Tongaland, and, probably, also with "Ibungu." Seeds of the "Mpai" would be easily obtainable in Durban if it were found to have commercial value, and its best flow should be through the summer months, and from trees in rather swampy ground.

It must not be overlooked that the conservation of the Tongaland Rubber requires also the conservation of the Forests, the value of which, for other purposes than Rubber, is altogether unknown, but must be very considerable. Any license or concession should protect these against all felling until their timber value is better known, and the possibility of working them for other lines is ascertained.

From the correspondence, it appears that Missionaries in Amatongaland are desirous to encourage industrial pursuits among the natives there. I recommend that if the above scheme be approved, these Missionaries be placed as Correspondents with this Office (Conservator of Forests) to receive advice, and so far as may be considered advisable to receive seeds and plants of the tropical products not obtainable by ordinary trade means; that they report on these products, and that their stations be subject to occasional inspection; but would deprecate their being allowed to trade in rubber, or giving them any liberty with regard to Forest Products, except in so far as it may be expedient to make use of them in experiments conducted on written permission direct from this Office.

T. R. SIM, Conservator of Forests.
12th November, 1902.

Coffee Leaf Disease.

THE following is published for general information:—

Botanic Gardens, Berea, Durban.
December 9th, 1902.

A. N. Pearson, Esq., Director of Agriculture.

Sir,—In your article on the "Work of an Agricultural Department," published in the last number of the *Agricultural Journal*, I notice that amongst other things proposed for investigation is the coffee leaf disease (*Hemileia vastatrix*). Many years ago I was the means of this pest being found in Natal, and since then I have taken much interest in the matter, having been myself a coffee grower. So

far as known to me there have been but two species of *Hemileia* identified, *H. vastatrix*, whose origin is unknown, but which is only found on the coffee plant, and *H. Woodii*, found by me more than twenty years ago on the leaves of *Vangueria infausta*, to which plant it is confined. When visiting the Lower Umzimkulu in 1884 I found *H. Woodii* rampant on its host plant in the vicinity of several large coffee estates. I therefore gathered specimens and showed them to several of the planters, one of whom, Mr. Bisset, had seen the ravages of this fungus in Ceylon. I advised them to eradicate the *Vangueria* as far as they could do so, and asked them that if any

similar fungus appeared on the coffee trees to send specimens to me. Two or three weeks afterwards some specimens on coffee leaves were sent to me, and proved on examination to be not *H. Woodii*, but *H. vastatrix*, and my identification was confirmed at Kew. Shortly afterwards the fungus appeared on the Reit Valley Estate, more than 100 miles from where it was first found. Since that time several varieties of coffee have been advertised as being proof against the disease, one of the last, if not the last, being a variety called "Maragogipe." I therefore obtained a plant or two of this variety, only to find that it is as liable to take the disease as the one we had in cultivation years ago, and a specimen of it in the garden here is in the season covered with spores of the fungus. A year or two ago I obtained from a friend a plant or two of a coffee from the East Coast, which have since borne seed and plants have been reared from them. This

plant is either *C. zanguebariae*, or very near to it; both leaves and berries are smaller than those of *C. arabica*, but the plants are very vigorous. One of them is growing close to a plant of the Maragogipe, which has for the last two or three years been covered in the season with spores of the fungus, and, though I have tried to inoculate the East Coast variety by placing spores on the leaves, so far I have not been successful in doing so. I have in consequence decided to graft either the Maragogipe or the ordinary variety, or both, on the East Coast plant as soon as the plants are large enough to do so, and my object in now writing is to offer you three or four plants so that you also may give it a trial if you wish to do so. The plants can be sent at any time, and should be fit for grafting upon next year. They are in single tins, and would grow quicker if planted out.—I have, etc.,

MEDLEY WOOD.

Weekly Rinderpest Report.

UP TO 6TH JANUARY, 1903.

Umsinga Division.

Location.—Menyazunga: 6 deaths to date.

Ladysmith Division.

Modder Spruit.—1 dead; 2 sick.

Krantzkop Division.

Amobonvu Location.—No fresh cases.

Zululand.

Eshowe District.—37 dead; 55 sick.

Mahlabatini District.—22 dead; 4 sick.

Umlalazi District.—Nothing to report.

Nkandhla District.—Nothing to report.

Nqutu District.—8 dead; 4 sick.

Lower Umfolosi District.—Nothing to report.

Entonjaneni District.—6 dead; 7 sick.

Nongoma District.—7 dead; 24 sick.

M. J. HIME,

for P.V. Surgeon.

6th January, 1903.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

Owing to the Christmas and New Year's holidays, with the visit of the Right Hon. J. Chamberlain in addition, trade has been

almost at a standstill; in fact, sales have been almost nil.

Mealies.—Notwithstanding the arrival of American mealies, and the prospect of more in the near future, Natal grain is realising

about 22s. per muid; but in the face of the fact that considerable quantities are expected, the above price will not be exceeded.

Hay.—Small quantities coming forward, at about the same prices as last quoted. Bedding, as usual, according to size of load.

Forage.—Some fair samples offered at prices varying between 7s. 3d. and 10s. per 100 lbs.

Potatoes.—Market well supplied, at prices between 6s. 9d. and 15s. per 100 lbs.

Onions.—From 8s. 9d. to 13s. per 100 lbs.

Mabele.—This grain is scarce and commands as much as 14s. 3d. to 15s. per 100 lbs.

Lucerne.—Average price 4s. 6d. per 100 lbs.

Butter.—From 1s. to 2s. 2d. per lb.

Eggs.—From 2s. to 3s. and 3s. 6d. per dozen.

Poultry.—Common fowls from 2s. to 3s. 6d. and 4s. each; ducks, 8s. to 10s. per pair; turkeys (cocks), 22s. to 29s. 6d. each; (hens), 14s. 6d. to 15s. each.

Sundries.—Mutton, 7d. to 10d. per lb.; bacon, 7d. to 8d. per lb.; hams, 8d. to 1s. per lb.; rabbits, 1s. 3d. each.

Vegetables.—Beans, cabbages, carrots, chillies, cucumbers, échalots, herbs, lettuce, marrows, onions, peas, rhubarb, and tomatoes.

Fruit.—Apricots, bananas, grenadillas, lemons, plums, peaches, and pineapples.

Firewood.—From 10½d. to 1s. 1d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business is decidedly dull, and there is a set-back which is difficult to account for.

Mealies.—The market is tolerably firm, but the immediate arrival of considerable stocks of both North and South American grain is having a deterrent effect, and no further advance is possible. About 22s. is the ruling figure for midland mealies.

Potatoes.—The market is very bare of supplies, but the good rains we have had will bring the crops along nicely, and prices will soon be within reason. At present the extraordinary figure of 21s. a muid is asked—a price without precedent at this time of the year.

Forage is still fairly abundant at 10s. per 100 lbs. Neither hay nor amabele is obtainable, and all Natal produce is more or less scarce; but for importation the consumer would be in a bad way.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1906, writes:—

Owing to the Christmas and New Years' holidays the market was very well supplied both with vegetables and poultry. Any amount of fruit is also coming in. Poultry, on account of such large quantities coming in, the market was very nearly glutted. Oat hay is still a drug in the market, bringing every other fodder considerably down in

price, and it still continues coming in in large quantities. The prices are.—

	From		To	
	s.	d.	s.	d.
Bran 100lb. bag	12	0	12	6
Butter (fresh), per lb.	1	6	1	9
(haff, 100lb. bales	9	0	12	0
Kafir Corn, 203lb.	27	6	30	0
Mealies (best), 203lb. bag	26	0	27	6
" (medium), 203lb. bag	18	0	20	0
Boer Meal (sifted), 203lb. bag	32	6	33	0
Boer Oats, 133lb. bag	12	6	14	0
Oat Hay (best), 100lb. bundles	9	0	12	0
Onions, 125lb. bag	25	0	27	6
Potatoes (best), 163lb. bag	30	0	37	6
" (medium), 163lb. bag	25	0	27	6
Eggs, per dozen (fresh)	4	6	6	0
" " (imported)	1	6	2	6
Ducks, each	6	6	7	0
Fowls, each	3	7	6	0
Geese, each	6	6	8	0
Turkeys, each (Hens)	9	0	0	0
" (Cocks)	20	0	22	6
Tobacco, per lb.	0	6	1	6
Firewood, per load	1	3	1	6

WOOL.

Mr. James Egner writes:—The wool sales of this week, when about 1,200 bales were offered, showed a further lower tendency; a large proportion of the wool was with drawn. The top price for light and well skirted wools was 8½d., while the average clips and unskirted brought from 8d. to 8½d. The bulk of the wool came from Griqualand East, and was very yoke. Short wools ranged from 5½d. to 6½d. The London sales will open on the 24th inst., and the present prices will then be tested. The end of this month will see about the end of the clip.

The very latest leaping record, like its predecessor, comes from America, and it carries with it a certificate signed by Mr. George B. Hulme. The performance was achieved by a bay 12.3 pony, which, with a twelve-year-old boy on his back, cleared a bar raised six feet from the ground. The feat is attested to by Mr. Hulme, who was one of the judges at St. Louis Show, where the leap was taken and accepted as reliable, especially as he adds that the measurements were verified by the application of a carpenter's tape.

Some of the references to old races, to be found in various manuscripts, are very quaint. This is from a MS. in the Harleian correspondence, dated 2nd April, 1602: "This day there was a race at Sapley, near Huntingdon, invented (arranged) by the gents of that country. At this Mr. Oliver Cromwell's horse won the silver bell; and Mr. Oliver Cromwell had the glory of the day. Mr. Hynd came behind." This Mr. Oliver Cromwell is believed to have been an uncle of the Protector.

The Agricultural Journal

AND MINING RECORD.

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NOTICE.

The attention of Readers is called to the reduction in the Publishers' Prices for Reading Cases and for the Binding of Yearly Volumes.

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Collect on Delivery.

SO far back as April, 1898, we drew attention to the system of forwarding consignments by railway, known as C.O.D., or Collect on Delivery. The inconvenience and, indeed, often great trouble experienced in collecting small accounts operates adversely not only as regards the retail consumer but also the producer. There are many businesses of the greatest magnitude which depend on the multitude of small transactions. A business of this character is largely dependent on a host of clerks; and farmers, treating the subject from a farming point

of view, universally abhor clerical work. That aversion makes them refrain from doing retail trade, a class of trade which they associate with great correspondence, much trouble, and possibly disagreeable, account-collecting and uncompensating returns. In most countries, including Canada and the United States, this worry is done away with by the facilities afforded by the railways and other delivering agencies. The producer announces by advertisement or otherwise to the public what he has for sale and its price. The goods for which he receives

orders, butter, potatoes, poultry, meat, etc.—very probably in a few words on a postcard—are sent to the railway, and there his work and responsibility end. The collecting is done by the railway. The carter, on delivering the produce, demands, in addition to the carriage, the price of the goods delivered, and in due course this is remitted to the producer. To town consumers of farm produce the advantages of C.O.D. are great, and in respect of Natal they would be of exceptional benefit. A producer could often profitably supply, say, by arrangement, once or twice a week, vegetables or fruit of the season at a fourth or fifth of the price demanded by the Indian hawkers. In England and many other countries there are railways which supply boxes of various standard shapes for packing fruit, vegetables, etc. These boxes are sold at very low prices with two objects chiefly in view—close packing in the vans, and for doing away with the need of returning empties. For instance, the Great Eastern Railway sells at all its stations several sizes of boxes. No. 1, in length 10½ in., in breadth 7½ in., in depth 3 in., costs 1½d.; and No. 6, 21½ in. x 14 x 7, costs 5d.

In the Cape Colony for a considerable number of years the facilities afforded by C.O.D. system have been enjoyed, and a few months ago those facilities were extended to the youngest of the South African Colonies—Rhodesia.

In England vested interests make the introduction of departures from established customs always a matter of difficulty, but even there, as the following extract from a London newspaper will show, the principle meets practical and growing recognition:—

“A suggestion has been made to Mr. Austen Chamberlain by a Hawick manufacturer that he should introduce into the Post Office the Continental system of collecting the price of parcels on delivery to the purchasers. Private carriers in London—notably Carter, Paterson & Co.—have already adopted the system, and find it works well and easily. A leading official in the Parcel Post Department of the General Post Office said that the Post Office were prepared to enter upon the work directly the scheme was adopted. Already the Post Office collected import duty on parcels from abroad, and there was no reason why they should not collect the price of parcels sent by traders to their customers. The system had not been adopted hitherto on account of the hostility of country traders. People instead of making purchases at the drapers’ shops in the provincial towns would send to the big West End establishments for what they required, and other trades would feel the competition in a similar way.”

Readers who may care to peruse the C.O.D. rules of the Cape Railways are referred to No. 4, Vol. I.

Paspalum Dilatatum.

MR. P. D. SIMMONS, Bray Hill, Mooi River, forwards a stalk of *Paspalum dilatatum*. In length it is over eight feet. He says it comes from a favoured spot well manured, and was cut in September, and is again being cut. He gives the general measurement as being about 6 feet. In the open, and unmanured, Mr.

Simmons says the length is only some sixteen inches. A Polela resident, on being told the length of this stalk of grass, said that he had a small patch of *Paspalum dilatatum* growing on poor soil, unmanured, and wind swept, which reaches six feet in length.

Dipping Tanks.

THE Minister of Agriculture is in communication with the Agricultural Associations of the Colony on the subject

of erecting cattle dips. An offer to share in the cost and maintenance on the £ for £ system is made by the Government.

In No. 10, Vol. V., will be found a plan of the Dipping Plant at Nel's Rust, and in the same issue the "Rules of a Queensland Dipping Co." are published. In No.

8, Vol. V., "Ergates," in an interview with Mr. Geo. D. Alexander, gives a full and detailed description of the Nel's Rust plant, its construction, cost, etc.

Crown Land to Lease.

CERTAIN Crown Lands situated within the Magisterial Division of Ipolola, and surrounded by Native Trust Lands, shall be open for lease for grazing and agricul-

tural purposes for terms not exceeding five years, and in areas not exceeding 1,000 acres, upon conditions published in the *Government Gazette* of 20th inst.

District Reports.

EMP'ANDHLENI, 31st December. — The weather has been pleasant, with frequent mist and drizzle. The total rainfall was 3.35 inches, maximum temperature was 92 degrees, minimum temperature was 35 degrees. One Native woman and a beast were killed by lightning. The people are all very busy hoeing and cleaning their crops, which are at present looking very well; and down the Nsuzi Stream mealies are ripening; on the high veld all crops are very backward. Just at the present time there is a scarcity of grain, and mealies are being bought up readily from the traders, who are bringing them in at £2 per muid. No locusts were reported. There have been no fresh cases of lung-sickness. Rinderpest remains much the same, there being fresh outbreaks in the Wards of Ndube and Sitshitshili. At the latter place only one head has died so far, and all the cattle around were at once inoculated. The mortality has been very heavy in the Ward of the Chief Siswana, and is still spreading at the Magistracy. It is to be regretted that at places it is next to impossible to get the Natives to have their cattle inoculated. Since the appearance of the disease in July last it approximately may be said that some 304 head have died. It must be remembered, too, that some 63 head died at the beginning of the year. This is a serious loss in cattle to the District, and the disease is still spreading. There are now three inoculators working in the District. Sub-Inspector H. R. Hellet, N.P., with 25 Zululand Police arrived on the 26th instant, re-opening O District, and took charge of the Police here. On the whole the health of the District has been good; usual colds have been prevalent.

C. C. FOXON, Magistrate.

MAHLABATINI, 7th January. — The weather has been mild for the time of year,

rain having fallen on several days. I have been unable to take meteorological observations, owing to the non-arrival of the necessary instruments. Crops are coming on well, and look healthy. Grain of all kinds is very scarce in the District, and the little that is brought in by traders is readily disposed of, at prices which leave a good margin for profit. Stock is looking well, and rinderpest has all but died out. Lung-sickness broke out at the Sikwebezana, but seems to be of a very mild form. The cattle have in each case been inoculated. The District Veterinary Surgeon from Eshowe paid the Magistracy a visit at the close of the year, and shot a young colt belonging to Mr. C. A. Wheelwright, it being affected with glanders. The other horses were all tested and passed, with the exception of Trooper Moor's charger, which has to be again tested in a month's time. During the month some men of Tshanibezwe's tribe killed two white rhinoceri at the Infabeni. Twenty-nine were convicted and sentenced to fines varying from £50 to £100, or in default to imprisonment from three to six months. The game preserve guards report having seen a large number of white rhinoceri recently, and two more were reported to be making their way up the Black Umfolozi, in the direction of where the others were killed. Buffalo are reported to have largely increased, and Blue Weldebeeste and Waterbuck are said to be in large numbers. The heat in the preserve is driving all these animals out on to higher ground, and a good view may be had of them almost any time. Wild dogs continue to kill Waterbuck, the latest being a fine young cow.

A. J. S. MARITZ, Magistrate.

NEWCASTLE, 14th January. — The weather continues hot and dry, with only an occasional good thunderstorm, for which we are thankful, the vegetation, including weeds, coming

on rapidly. Crops will, I fear, be conspicuous by their absence, and the local supply of grain will not suffice—Natives are already giving 30s. to 40s. per sack for mealies. Stock is in good condition, and as a rule healthy, excepting horses, amongst which there are many cases of mange, notably amongst those of Kafirs. I know also of cases of glanders and horsickness. I see in the *Journal* of the 9th that Mr. W. Stecombe, of Central Bucca, advocates the propagation of *Paspalum Dilatatum* by seed in preference (presumably) to growing from roots, and also states that it is more drought-resisting than other herbage. The grass grows readily here once it has a

fair hold, but it has now advanced more than native grasses during the late abnormally dry time, and local seed I have planted has not germinated. I have noticed also that stock do not take to it until the native grasses have been fed off. Readers of the *Journal* would like to know if there is any particular method to be observed in the sowing of seed in the country, as there are no "scrub lands" to burn before sowing. I notice that it flourishes best in the near vicinity of drains, and it favours good land, but it is a strong grower, and might be tried by farmers with advantage.

J. O. JACKSON, Magistrate.

Bananas, Cultivation.

THE following is extracted from the Hon. W. Fawcett's paper on "The Banana Industry of Jamaica":—

VALUE OF PLOUGHING.

Various opinions are held by banana planters about ploughing. Some who have planted in light, loamy soils have been reaping excellent crops for some years without any ploughing. Others, with heavy soil, plough every eight weeks with a 6-inch plough, alternately one way and across. Others again plough only once a year.

A friend who is establishing a cacao walk with bananas before planting, ploughs, cross-ploughs, harrows, and when necessary, trenches, afterwards he ploughs with a small plough (with moon-coulter attached) three to six times a year. On banana lines, where a plough cannot work, he forks occasionally and hoes frequently. He says that the plough is far more effectual in breaking up the soil than any other implement he has tried, and it keeps the land clean much longer. The plough works from 4 to 6 inches deep, and the cultivator 2 to 3 inches. Another planter forks once a year, and uses the cultivator to keep the weeds down. When the grass is too high for the cultivator he uses hoes, and only substitutes the plough for the hoe or cultivator when labour is scarce. Both plough and cultivator are kept to 2 inches in depth in order to avoid destroying roots.

ROOT PRUNING.

Keeping down weeds, maintaining a surface mulch, and loosening the soil, are all important matters in the cultivation of bananas as of other plants, and I am of opinion that a judicious pruning of the roots by the plough is also of great value, for as the roots do not naturally branch but grow straight out to great distances, pruning the roots induces branching at the several ends, and a further production of roots from the bulb.

A planter for whose judgment I have the greatest respect writes as follows:—"I do not think that ploughing close to the banana and cutting through the roots does any harm. On the contrary, I am certain it does good—principally, I think, because the cutting gives fresh impetus to the roots, and this activity increases the growth of the plant. Take, say, potatoes or turnips, which are usually grown in drills 27 inches wide: so long as a horse hoe can work in these rows it is good cultivation to keep working, even to the damage of some of the leaves. Every time it is put through all the roots crossing the drills must be cut, yet you see the greatest improvement in the growth of these plants."

EXPERIMENT AT THE HOPE GARDENS.

The following experiment, made at a banana plot in Hope Gardens, throws light on the subject of the formation of new roots induced by cutting them back.

In planting the plot holes 3 feet wide and 2 feet deep were dug, the soil was returned to the holes and the suckers planted therein. The surrounding soil was ploughed and cross-ploughed after the plants began to grow. The soil is deep, rich, black, and rather heavy.

On November 19th, a trench one foot wide and $2\frac{1}{2}$ feet deep was dug half-way round a one-year old banana stool at a distance of 3 feet from the stem that was about to fruit, and the soil returned. In doing this the thick fleshy roots, some of them 5 feet to 6 feet long, were severed. No roots were found below 6 inches from the surface. Ten days later the soil between the first trench and 8 inches from the stem was removed, to the depth of 2 feet 6 inches and returned, cutting off all the roots with the spade to within 8 inches of the stem. It was noticed when doing this that the roots that were cut off at 3 feet from the stem had thrown out numerous fibrous roots down their entire length.

A month later, on December 30th, the soil was opened up from 3 feet inwards. New roots were seen to have grown out 3 feet from the stem down to a depth of 2 feet from the surface. These roots were carefully followed back to the stem: some proved to be new roots direct from the stem, whilst others had grown out from around the cut ends of the original roots, one root giving rise to five or six vigorous feeders.

Some of the cut roots did not grow at all but remained just as they were, except that they died back some 2 or 3 inches; this was more noticeable near the surface where they would come under the influence of dry weather. Some deeper ones had, however, rotted back a few inches, due perhaps to the ragged cut by the spade, or the root itself being injured at its junction with the stem with the pull of the cut.

The roots on the undisturbed side of the plant simply lengthened out a little and remained near the surface, 5 inches being the lowest depth at which roots were found.

The plant did not seem to have suffered any ill effects from the disturbance of its roots on one side.

LATE PLOUGHING NOT ADVISABLE.

In my opinion ploughing so as to cut the roots close to the stem should not be allowed when it is possible that the embryo bunch is being formed, as the stored food-material would be used to form new roots instead of being utilized in the bunch. How this loss of food-material affects the bunch we do not know—whether it delays the shooting, or affects the size of the bunch or the fingers. This subject of the use of the plough was discussed at the Banana Conference in Jamaica, and as a result some planters do not now plough except after the main crop for the American market is reaped, and not later than November.

Where ploughing is not the practice, the fork is used to great advantage when the young suckers are two months old.

Where the rains are constant, and the soil heavy, the cutlass is the best tool in weeding. The hoe and the assam fork and the cultivator are tools used under different conditions. The disc-harrow is an admirable instrument, and should be in constant use so long as the soil is sufficiently dry. If the ordinary plough forms a pan, a subsoil plough is used occasionally to secure good drainage.

“Some horses have a propensity to lie down in the water, and I have been applied to for a remedy,” says John Adams in his book on *Horsemanship* (1805). “I remember reading of two remedies. The one was to be provided with two pistol bullets, having a hole drilled through them to suspend them by a twine thread, and at the instant the horse is going to lie down to drop the bullets into both his ears.” Adams does not think much of this cure, pointing out quite truly that it requires the horseman to use both hands while the horse is either moving his ears to and fro or stretching out his head in the act of lying down so that his ears are out of reach. The other remedy was “to be provided with a flask of water, and at the instant the horse is going to lie down, to break the flask of water on his head that the water may run into his ears.” The surprise occasioned by smashing a bottle over his head would probably cause the horse to change his mind about lying down, without any assistance from the water, which might run anywhere but into his ears; but Adams sensibly suggests that the application of a light switch to his head or ears would be at once more convenient and quite as efficacious.—*Live Stock Journal*.

Richmond Agricultural Society.

ON the 20th inst. the Annual Meeting of the Richmond Agricultural Society was held. Mr. A. W. Cooper, J.P., presided. From the President's report the following is taken :—

"Several outbreaks of Rinderpest have occurred in the northern parts of the Colony and Zululand; but this disease, which was so greatly dreaded at one time, appears to be well within control, and now causes but little anxiety. The efforts of the Society with regard to the question of narrow gauge railways have to some extent been rewarded, as a resolution was carried in the House of Assembly during the annual session, in effect approving this principle of railway construction in suitable localities. Your delegates to the Natal Farmers' Conference attended all its meetings during the past year, but nothing of special interest to this district was brought before it. This institution continues to render valuable service to the farming interests of the Colony. Suggestions for the formation of a Farmers' Co-operative Association were submitted by a committee appointed by the Conference, known as the Produce Committee, which will probably receive further consideration. A communication has been received from Mr. John Kirkman, chairman of the Lands Advisory Board, with reference to the possibility of establishing settlements of small farmers in this neighbourhood, and the most probable lines upon which success may be expected, and requesting that the matter may be brought before the Society. This most important question, in view of the closer settlement of the Colony, is a matter which should be carefully considered and discussed. That a very much closer settlement of the land by Europeans in the future is possible appears as certain as it is necessary in the interests of the Colony; and I trust that this request made will receive the attention of the incoming officers and committee of the Society. The Government have purchased land at Reit Spruit, near Howick, for the purpose of an experimental farm, and operations have been commenced. A

considerable area seems to have been broken up, and some temporary buildings erected. A railway siding is in course of construction for the use of the farm. I have much pleasure in tendering the thanks of the Society, and my own appreciation of their careful work and assistance, to the hon. treasurer, Mr. Robert Nicholson, the hon. sec., Mr. John Marwick, and the officers and committee of the Society for their services during the past year; and must express my regret at not having been able personally to give as much assistance to the Society as I have been able to do in former years."

The report was adopted.

ELECTION OF OFFICERS.

The following officers were elected :— President, Mr. A. W. Cooper; vice presidents, Messrs. T. Flett, W. P. Payn, W. Comrie, and the president of the Durban Chamber of Commerce; hon. treasurer, Mr. R. Nicholson; hon. secretary, Mr. John Marwick; hon. auditors, Messrs. J. Hackland and C. Nicholson.

THE COLOUR QUESTION.

A letter from the Maritzburg Society on the subject of coloured exhibitors at shows was considered.

The Secretary stated that two years ago the Society passed a resolution that they should not allow coloured exhibitors.

The President: I think the Maritzburg Society want an expression of opinion as to whether coloured exhibitors should be allowed.

A resolution in favour of excluding coloured exhibitors was carried by nine votes to five.

The quantity of fat in milk is not the only standard by which it should be judged. Nearly all cows when fed plenty of wholesome food will give milk sufficiently rich for ordinary use, but milk produced in low, damp barns, the cows fed on musty hay, soured brewery slops, mouldy corn fodder, bedded with an oak plank, and curried with a milking stool, is not a good food, although it may test 6 per cent. of butter fat.

Pound Notices.

To be sold, on 18th February next, unless previously released:—

Stanger.—One mouse-coloured mule, found by Natal Police, at Esidumbeni, on the 13th inst., branded $\text{£} \sim \text{I}$ on near quarter.

Ladysmith.—Bay gelding, piece out right ear, star and faint stripe down face, near hind foot white, tail and mane medium length, branded P on right shoulder, and A on off hindquarter, 13½ hands high; bay mare, branded P on right shoulder, and A on off hindquarter, long tail, mane medium length; no other brands visible, 13.3 hands high.

Greytown.—Dark bay Russian gelding, branded R on off shoulder, condemned Government brand on near hip, sores on back, aged.

Richmond Road.—Dark grey gelding, about 14 hands, no marks or brands.

Moss Dale.—Bay mare, lame on front left leg, branded A on left flank; grey mare, branded A on left flank; black-and-white Madagascar ox, no brands.

Weenen.—Blue grey ox, tail stumped, left horn down and tip broken off, white belly, one cut right ear, three cuts left ear, indistinct brand right hind leg.

Pomeroy.—One black-and-white Madagascar ox, small and thin, V near shoulder.

Harding.—Grey mule, branded something like T on left hind flank.

Pietermaritzburg.—Large red ox, long tail white tip, small white patch under belly, branded AC off quarters, impounded from Zwaartkop by a Native named Nokanits; chestnut pony gelding, white star on forehead, white patch on nose, branded PF near quarters, has been down both knees, has been mangy, height about 13.2, aged. Impounded from Bishopstowe by Mr. E. Clark.

Running on the farm of Mr. C. Comins, Newington, York:—Bay mare, long tail and mane, branded indistinct, looks like FR.

Meran.—Bay gelding, branded PU, about 14 hands, short mane and tail, blaze, scar of old sore on back. Impounded on the 24th December, 1902.

Moss Dale.—Roan stallion, white blaze, about 13.2, no brands. Probable value, £8. Impounded by the Natal Police, Newcastle. The above animal will be sold at the expiry of one month from this (1st January) date if not previously released.

The following to be sold, unless previously released, on the 18th February next:—

Impendhle.—Bay gelding, branded JI near thigh; bay mare, no brand.

Dundee.—Dark bay gelding, arched mane, piece out of right ear, branded HE right buttock, good condition; blue gelding, old wound on right of neck, as if done with

barbed wire, branded indistinct, looks like £L (L turned); she goat, black with white patches, slit in both ears, with young white kid.

Gold Luck.—Bay mare, switch tail and long mane, no brands, about ten years old, about 14 hands high.

Candella.—Yellow mule, hogged mane and tail, black stripe over wither, branded J on left hindquarter, in fair condition.

Reported by Mr. W. Clark, Camp Hill, as too wild to be driven to the Pound:—Black Madagascar ox, with white face, branded on right hindquarter 42; red Madagascar ox, white face and little white under belly, branded on left hindquarter, B.L.B. on right hindquarter, S.E.C. and 00 on right shoulder.

Ndwedwe.—Chestnut pony mare, four white stockings and white blaze down face, white hoofs, square cut tail, long scar on inside of off hind hock.

DUNDEE AMENDED NOTICE.

The light bay gelding, branded KL off buttock, reported in the *Government Gazette*, 23rd December, 1902, Government Notice No. 827, 1902, should be light bay "Rig."

Dundee.—Chestnut stallion, white bless, white stocking off hind leg, hogged mane, right ear slit front, no brands, probable value £10. Impounded this day by K. Hellberg, of farm "Karlsruhe." The above animals will be sold at the expiry of one month from this (5th January) date if not previously released.

Nqutu.—Sheep (ram), probable value £1. Impounded by Christian, a Native, on the 4th January, 1903. The above animal will be sold at the expiry of one month from this date (7th January) if not previously released.

Nqutu.—Goat (ram) white, no marks, probable value £1. Impounded on the 8th January by Sheyabantu (a Native). The above animal will be sold at the expiry of one month from this date (9th January) if not previously released.

Estecourt.—Dark cream gelding, branded faint broad arrow left top of hip, white patch on nose, star on forehead, black mane, right foot white.

Colenso.—Black-and-white Madagascar ox, branded RVI D on near shoulder V on off hindquarter, two slits out of each ear, in very poor condition.

Meran.—Chestnut mare, about 14 hands high, branded with broad arrows, one over the other, near hip, R off shoulder, short mane, about eight years old.

Ginginhlovu.—Grey mule mare, branded shamrock under half circle near shoulder, J near hindquarter.

Maritzburg.—Bay pony, gelding, fleabitten, what looks like a brand 3 nearquarters, height about 13.2, aged; red white ox, branded O off quarters, nick out of both ears, long tail, lower half white; a small dark brown mule, mare branded T V near quarters, L 7 off quarters, has a small wound on near shoulder; bay gelding, height about 14.2, no brands visible, long mane, square cut tail, aged.

Charlestown. — Red ox, branded broad arrows (condemned brand) near rump; large black ox, branded A.O. right hind leg, and slit out of left ear; black mare, star, branded T near rump, aged, white on nose; brown gelding, star, branded A on near shoulder and B. C. on near rump, two white patches on back, aged; grey gelding, branded P on off hind leg, aged.

Richmond.—Black ox, white on belly and hind legs, no brands.

Moss Dale.—Small bay pony, shod all round, no brands; dark bay mare, hog mane, square cut tail, no brands.

Acton Homes.—Dark brown gelding, aged, about 15 hands high, off hind foot white, indistinct brand on near quarter, looks like A very low in condition, and mangy. Black gelding, aged, indistinct brand on near quarter, looks like A very low in condition, and mangy.

Ladysmith.—Black cow, white patch on off side, white on forehead and under belly, branded on near side, S 91 (recently branded) C1 on off quarter, OC on off shoulder, /A on off quarter, no brush on tail, has red bull calf at foot.

Reported by Mr. J. De Waal as running on the farm Bluebank, on the 15th instant, and too wild to be driven to the Pound:—White she goat, left ear half moon in front and beneath, with white kid; white yearling goat, Kapather, left ear point cut off.

Reported by Herman Illing, as running on the farm Krantz Kloof, and too wild to be driven to the Pound:—Black cow, short tail, branded indistinct brand, about ten years old.

Weekly Rinderpest Report.

UP TO 20TH JANUARY, 1903.

Umsinga Division.

Location.—Manyzunga: 22 dead to date, 3 sick.

Ladysmith Division.

Modder Spruit.—1 sick.

Krantzkop Division.

Amobonvu Location.—28 deaths to date. No fresh cases.

Zululand.

Eshowe District.—19 dead, 24 sick.

Mahlabatini District.—21 dead, 14 sick.

Umlalazi District.—21 dead, 14 sick.

Nqutu District.—Report not received.

Lower Umfolosi District.—16 dead, 27 sick.

Nongoma District.—13 dead, 38 sick.

S. B. WOOLLATT,

P. V. Surgeon.

20th January, 1903.

Gleanings.

The Department of External Affairs, Australia, has received a communication from Lord Milner asking for particulars and prices with regard to the supply from Australia of merino rams and ewes for the Transvaal, delivery to be made at Durban. A similar communication has been sent to New Zealand.

It is reported from Montserrat that some canes of the variety B. 147, which had been allowed to "stand over" from last season at Gages estate, grew to an abnormal length. One of these, dressed ready for the mill, measured 18 feet, and contained fifty-six joints, the longest joint measuring 7 inches. The plot was planted in May, 1900, and raped in November, 1902.

A milk dealer sued a farmer in Doncaster County Court for supplying poor quality of milk. A certificate was put in to the effect that it contained 40 per cent. of added water. The farmer was fined £5 and costs, and the dealer received £30 for breach of contract.

Grenada presents an interesting example of the substitution of one industry for another. The exports of sugar in 1882 were of the value of £21,000; by 1894 they had fallen to £50, and now the island does not grow enough for its own consumption. The cacao industry has developed whilst sugar has declined, and the exports of cacao in 1900 were worth £270,000.

The Plant Enemies of Plants.

(Concluded.)

PARASITIC FLOWERLESS PLANTS.

There are several groups of parasitic flowerless plants. Chief among these are the fungi and bacteria. Before passing to the two first mentioned groups, reference should, however, be made to those pseudo-parasites known as "lichens."

To thoroughly understand the nature of a lichen it is necessary to mention something of two related and lowly organised divisions of flowerless plants, the *Fungi* and the *Algæ*. Both are placed together as sub-divisions under one heading by botanists, but they are essentially different in as much that the fungi are without colouring matter, whilst the algæ have colouring pigments. Following, therefore, what has already been pointed out in speaking of the green colouring matter in higher plants the algæ are capable of assimilating inorganic substance for their own nutrition; whilst the fungi, lacking such functions, are dependent on organic matter for existence. A discussion of either of these groups is not necessary here but it might be well to point out that algæ exist in great variety. They are not, however, as popularly known as many other groups of the plant world, as upon the whole they are aquatic, living in salt and fresh water. The most conspicuous are the seaweeds, but many are minute one-celled plants.

Lichens are to be seen commonly in the moist kloofs and forests of Natal, and are often found in abundance upon trees, logs and stones, particularly on this coast. Some forms upon bush trees are very familiar, whilst others which grow upon the leaves of the mango, and the leaves and stems of citrus trees, will have hardly passed unnoticed. To the student of botany these plants present a most interesting study, indeed it may be said of them that they are the most interesting members of the plant world.

This is because whilst they form a complete whole, they, as a matter of fact, consist of two plants, an algæ and a fungus growing together, each contributing to the welfare of the other. This

peculiar habit of life is known by the term *Symbiosis*, and in the parasitism of the mistletoe a somewhat similar state of affairs exists between host and parasite.

In the case of a lichen, the fungus part of the plant furnishes water containing food in solution for the algæ, and at the same time it envelopes the algæ and so shades and protects it. The algæ, being a plant containing colouring matter, has assimilative functions which the fungus has not, and the exercise of these contributes to the welfare of the fungus. The shapes and forms in which lichens are found are very varied. Some, such as those of the orange and mango leaves, adhere closely, and in consequence are said to be crustaceous, or to resemble a crust. Others are raised upon stalks and are many-branched—these are *fruticose*—others, again, are crumpled and leaf-like, and are said to be *foliaceous*. In colour lichens often vary; generally they are of a greenish hue, but many are yellow, grey, or red.

Upon the whole they are not regarded as parasites, although there are cases open to question; still, as they prevent a free interchange of gasses through the bark and leaves, when they occur in quantity, their presence is to be regarded as detrimental to the health of the tree.

FUNGI.

By far the greater part of parasitic plants are fungi. These are characterised, together with bacteria, by the absence of green colouring matter. They are divided into two groups according to their method of acquiring nutriment, those living upon decaying animal or vegetable substances being known as *Saprophytes*, and those feeding on living animal or vegetable matter as *Parasites*.

On other occasions I have already discussed the general characteristics and phenomena of diseases induced by these parasites, more particularly with regard to sugar cane spume, forage rust, potato blight, etc. There is one subject in con-

nection with the physiology of some fungus diseases, which I have been recently investigating and a brief review of which may prove of interest. This is known as *heterœcism* and the term is applied to those fungi which require to grow on two different plants to complete their life-cycle.

The illustration which I intend to use to explain this phenomenon, is a rhubarb disease which has recently attracted attention upon the highlands of Natal.

Rhubarb leaves affected with this disease are marked upon the upper surface with conspicuous red areas. The areas are circular in outline, varying in size up to half an inch in diameter and often depressed in the centre. Upon their lower surfaces the spots appear as pinkish cushions with a red margin. Upon examination with the microscope the pink area is seen to consist of large numbers characteristic little cups, grouped closely together. The cups are beautiful little objects and as they are filled more or less with spores, it requires no great stretch of the imagination to liken them to small baskets full of eggs. This particular form of fungus is popularly spoken of as "cluster cups," and in the spring of the year cluster cups are to be found upon a variety of plants.

All fungi are reproduced by spores, and, as a general rule the spores convey infection to plants similar to those upon which they are produced; just as the spores of potato blight carry the disease to potatoes. In this instance, however, such is not the case, for spores from the cluster-cups on the rhubarb are only capable of growing upon a particular kind of grass known as *Phragmitis*. Now both rhubarb and its nearest allies, the docks (upon which the disease also flourishes), are partial to moist lands, and it is only in moist lands and on the banks of streams that the *Phragmitis* grass is found. It is the largest of our local grasses, growing from 5 to 12 feet high, of a reedy nature, with broad flat leaves and a terminal silky panicle something like a sparse sugar-cane tassel.

On this plant, the spores from the little cup upon the rhubarb produce a disease, but it has nothing of the appearance or nature of the rhubarb disease, but is

exactly similar to the red rust of wheat or forage.

Briefly, the *Phragmitis* grass becomes infected with a rust disease from the rhubarb. The rust fungus produces a countless number of spores, and these are entirely different from those found in the cluster cups on the rhubarb. Like the spores of forage blight (*Puccinia coronata*) they are scattered about over this grass in the neighbourhood, and germinating, push their roots into the tissue of the leaves, and increase the area of the infection during the summer months. They are incapable, however, of infecting the rhubarb. During the autumn, the rust pustules produce other spores differing considerably in form and appearance. These are packed tightly together in elongate cushion-like pustules, and differ from the rust spores in being two-celled and of a dark brown colour. They are properly spoken of as teleuto-spores and are the form of the disease in which it rests during the winter. Unlike the red spores which preceded them, or the spores from the rhubarb cluster-cups, from which the rust of the grass originated, the resting spores are unable to scatter infection because they are so intimately associated together, and connected with the substance of the host plant. With the arrival of spring, however, their contents become active, and from the free apex, is produced a growth which may be termed a fruit stalk, and on this is born several small fruits or spores. The teleuto-spores may, therefore, be likened to the dormant fruit buds of a tree which in the spring produce fruit-bearing stems. The spores so produced are carried off the grass, and germinate at once if they alight upon the leaves of the rhubarb. Having germinated, they push their root into the tissue of the rhubarb, and growing therein produce the cluster cups, but are quite unable to give disease to the grass which gave them birth.

To recapitulate:—The spores from cluster-cups on rhubarb produce rust on *Phragmitis*, which form of the disease hibernates as teleuto-spores, which bear a further form of spore, which conveys the cluster-cup form of the disease to rhubarb and completes the cycle of the fungus growth.

BACTERIA.

These notes would be incomplete without some reference to those obscure diseases of plants which are attributed to the agency of bacteria.

Bacteria are popularly spoken of as "germs" and "microbes," and these microscopic organisms are now regarded as plants, bearing a relation to the fungi. Originally, upon account of their power of voluntary motion, they were thought to belong to the higher animal kingdom. Perhaps the distinction between plants and animals in these low types of life is somewhat artificial, but the weight of evidence and opinion is in favour of the *bacterium* being a plant and not an *animalcula*.

Bacteria are characterised by phenomenal powers of reproduction with vast rapidity. It has been estimated that if the rate of multiplication that has been observed could be maintained for 24 hours, there would be produced as the offspring of a single *bacterium* some 17,000,000 descendants, and in five days a mass sufficient to fill the oceans. Of course such a rate of increase is never actually maintained very long, owing to certain opposing influences, but the potentiality is always there, ready to develop at the favourable hour.

The presence of certain bacteria in the soil has a great influence on the growing of crops, and in many other directions their beneficial influence is felt by man.

Apart from this, however, most of the infectious diseases of man and animals, and many of the various processes of decay, can be readily traced to the action of certain germs, but it is only recently that plant diseases have been satisfactorily connected with them.

Plants, by the peculiarities of their structure, are protected against the inroads of bacteria, and furthermore the acidity of the juice is unfavourable to their growth within the organism. Indeed, not only is the plant protected against outside attack by the nature of its outer covering, but, when an entrance has been effected, the woody walls or cellulose of the cells offer further obstruction to them, so that their progress

is limited to the spaces between the cells and to the water channels.

In the case of animals, the germs may obtain easy access, being inhaled through mouth or nostril or taken in with food, and, having gained an entrance, their dissemination is rendered easy by the circulatory system of the blood and the many other channels for conducting the nutrient fluids.

The plants which are most susceptible to diseases induced by these agencies are those of a succulent and pulpy nature, and such plants when wounded are also very apt to decay, the rotting or fermentation being brought about by the access of germs to the tissue. Of the various plant diseases at present associated with bacteria it is not always possible to say where the micro-organisms have first gained an entrance.

In the finger-and-toe disease of turnips, etc., the germs enter through the roots, whilst in pear blight they are said to find an entrance through the flowers. However, in dealing with bacterial diseases of plants, what is more to be feared is the artificial spread of the disease, rather than its natural spread through natural channels from plant to plant.

Originally circumstances may be such that only one plant is attacked in a natural manner, and it is by the subsequent treatment of this plant by the cultivator, and to some extent by insects, etc., that the area of the disease is magnified.

Take, for instance, a crop grown as is sugar cane, and imagine a single stool of some cane which happens to have developed a bacterial disease. The disease from this may be spread, quite innocently, during cutting operations; the knife cutting the diseased cane carrying infection to—or inoculating—numerous neighbouring stools. Again, should such a cane be cut for sets, the disease will be conveyed to each set, and so a whole field of diseased cane may be produced. In Australia the "gumming" disease of cane has been traced to the presence and growth of bacteria within the fibre channels through which the sap or water taken from the soil is carried to the various parts of the plant. In certain

districts this blight is very common, and investigation has shown that the prevalence of the disease is maintained almost, if not entirely, through the carelessness of planters in their haphazard selection of sets from healthy and diseased stools alike. Striking illustrations of this have been noticed in cases where the cane crop has been a failure, and the introduction of new sets a necessity. When these sets were obtained from a district where the disease was not prevalent healthy crops have resulted.

In speaking of the mistletoe and of lichens, I have had occasion to refer to the symbiotic relationships existing between mistletoe and host in the case of the former and fungi and algae in the latter. A similar condition occurs between bacteria and the roots of the *Leguminosae*, or bean-bearing plants (peas, beans, clovers, acacias, mimosas, etc.) In the case of these plants, certain germs penetrate through the root hairs into the root, and there cause the formation of small tubercles.

These tubercles, or root-galls, become filled with a bacterial mass. Now the bacteria in them have the power of taking

up free nitrogen which they are capable of passing on to their host, whilst in return the host plant supplies the germs with the carbon compounds essential for their nutrition. That this is actually the case has been demonstrated by the fact that legumes with root tubercles contain more nitrogen than they could have procured from the soil.

The appreciation of this remarkable demonstration of Nature's economy has led to the use of legumes as green manures—among which the cowpea plays no small part. By growing a crop of cowpeas and ploughing them in whilst green, not only is there a good amount of humus placed in the soil, but it is also much enriched with nitrogen.

A propos of this value of the cowpea, I may conclude with the following anecdote illustrating some ignorance of it:—

Two farmers, travelling homeward by rail, were discussing crops and market prices, when one asked the other if he had ever tried cowpeas, because, said he, a fellow had persuaded him to buy some. "Yes," replied the other deliberately, "but take my tip and don't plant them, the cows won't touch 'em."

Poultry for Utility Purposes.

By J. F. MARSHALL.

(Concluded.)

ON farms, as a rule, are to be found a goodly number of hens that are worthless as layers. These can very easily be detected by their laziness and thickness about the head, and, further, they are very rarely seen to be foraging about for any of their own food, an exercise which is beneficial to laying hens and helps to keep them in good condition. Firstly, then, these bad layers must be discarded before we start to try and work up a proper laying strain. In every case it will also be noticed that these non-layers will eat far more food than the others and always appear hungry; they go for food when thrown down as if they had seen none for days, and so greedily will they eat that they become almost black about the head and choke.

EGG-LAYING HENS.

Where eggs are to be the sole object, mate a black Minorca cock with eight or ten full-sized pullets. When selecting these it will be necessary to pick out the most likely layers, as by so doing a laying strain can be worked up much quicker. The pullets bred from this cross will show a good deal of the Minorca even the first year, with fair-sized, neat combs. These birds will be very active and compact looking, and they should commence to lay at from five to seven months old. A distinct improvement will be noticed in the size of the eggs laid, most of which will be white. To these pullets I would mate a white Leghorn cockerel with only a medium-sized comb. I always consider a neat little comb far superior looking to

the large overhanging comb which is so often seen with the pure breeds. Of course the pullets from the above crosses would make very inferior sitters, and therefore I would not recommend them as sitters if they should come on broody.

GENERAL PURPOSE HEN.

For general purposes mate either of the following :—Orpington, Wyandotte, or Plymouth Rock cockerels with your hens. This would greatly improve the size of the common fowls, and would give good table fowls as well as layers. When early chickens are required these crosses would be found very useful, as they would come on to lay quite early, thus coming on to sit before the ordinary hen has started laying. They make good sitters and mothers. Most of them from these crosses will lay tinted eggs, some being quite brown, of fair size, and consequently saleable anywhere.

THE HOUDAN STRAIN.

Many people object to keeping birds which so often become broody. To these people I can recommend a Houdan cockerel. The Houdan is a large bodied bird with wonderful length of keel, and from this cross good table birds would thereby result, and would greatly check their broody propensities. The pullets from this cross would be excellent layers, and should be mated the following year with a Wyandotte cock of any colour, as long as it comes from a first-class laying strain. This would keep up the size of the birds and not interfere with their laying qualities, as without doubt the Wyandotte is one of our best winter-laying breeds, and suits this climate most excellently. I might also mention that any of these crosses may be kept either in confinement or quite out in the open. Farmers' birds, will of course, be allowed to roam about just where they please, and where this is the case I can confidently say where the above crosses are used almost double the quantity of eggs will be forthcoming from the same number of hens that were originally obtained from the common breeds before pure blood was introduced.

PURE BREEDS.

Those who prefer to keep pure breeds, and where the locality is damp, would find the Plymouth Rock or Wyandotte do well, both of which are very hardy birds. The Rock is a larger bird than the Wyandotte. It will also lay a larger egg, of good brown colour. Rocks make excellent sitters and mothers. The chicks from this breed are very strong and hardy, but generally grow their feathers slowly, and more especially is this noticed in the cockerels. From many strains of Rock quite black chickens will be thrown. These, in almost every case, turn out pullets, and make grand layers. They are splendid winter layers if fed and attended to properly, and, although they have a tendency to fatness, this may be largely overcome if they are given plenty of scratching exercise and are not allowed mealies. If required for sitting they are very good and cover their eggs and chickens well. These eggs are generally brown; the shade, however, varies considerably, some being very pale. To those who have a few Rock hens and wish to cross them for utility purposes, they would find a Golden Wyandotte or Houdan suit their purpose. If this cross were hatched at the proper season the progeny would make the best of winter layers, and should commence laying at about six months old.

GOLDEN WYANDOTTE.

The Golden Wyandotte is probably the best winter layer, so for this purpose it should be used as much as possible, as eggs in the winter will always command good prices. The eggs are of a nice saleable size and brown in colour. When broody they make good mothers, but they are not likely to come on broody as often as the Plymouth Rock. Therefore in many cases it is preferable to use the Wyandotte to the Rock.

MINORCA AND WHITE LEGHORN.

In pure breeds nothing will beat the laying qualities of the Minorca or White Leghorn both for quality and size. Both these breeds lay pure white eggs, and are bad sitters. These breeds do best where the ground is dry and sandy and fairly

well sheltered. When allowed liberty it is surprising the number of eggs they will lay, and it is very seldom one finds a bad layer amongst these two breeds. This is probably accounted for by their activity in constantly scratching and going over a vast amount of ground. For this reason, and being only fair-sized birds, they are not by any means big eaters, so farmers would do well to introduce plenty of Minorca and Leghorn blood into their stock.

FEEDING.

Even when fowls are allowed their liberty it is always advisable to feed regularly night and morning. The birds will then soon get to know just what time to return home, and be off on the hunt again as soon as their meal is eaten. Wheat, mabele, and good oats are the best cereals to use for fowls with entire

liberty. Mealies must be used very sparingly, more especially if eggs are the object. A few may be given during wet and cold weather without any harm. On no account give mealies as a regular food for laying hens, that is if you wish to keep them in good laying condition. The birds will also keep far more healthy when fed on the first three named corns. Sharp flint grit and oyster shell is another very important item which must not be overlooked. It is most desirable that laying hens should have both given to them every week, as a few shillings thus spent will be the means of keeping the birds in health.

When sending eggs to market take great care every egg is fresh and clean and all of an even size, as buyers will always give 3d. to 6d. per dozen more when from a reliable source.

The Non-setting of Fruit.

IN the *Agricultural Journal* of Victoria, Mr. G. H. Robinson writes:—

A common cause of complaint among fruit-growers is the non-setting of fruit. Every season this trouble is felt to a greater or less extent in one district or another, and information bearing on the subject is being continually sought. Hence it is well to enquire into the various causes which may induce non-setting, and ascertain what methods, if any, are known whereby the losses may be avoided either wholly or in part.

THE INFLUENCE OF INSECTS ON THE SETTING.

Taking the pear as an example, before the fruit can be formed the yellow powder, called pollen, which is produced by the stamens of the flower, must be brought into contact with the stigma, that is, the upper portion of the pistil, or female organ. In this position the pollen grain germinates and pushes forth a fine tube, which grows down into the soft tissue of the pistil till it reaches the ovule, fertilising them, and causing their

development into seeds, and it is the stimulus thus imparted that results in the formation of the fruit. Darwin has said that "Nature abhors self-fertilization," and here at least the statement is undeniably true, for it is found that the pistils of the flower mature about three days before the pollen. As a consequence, the pollen which is necessary for fertilization must be transferred to the stigma by some outside agent. The sugary substance, called nectar, which is secreted in the blossom, forms a strong attraction to many insects, and they, in their efforts to obtain this dainty food, inadvertently carry the pollen from flower to flower. Abundance of insect life at the blossoming time is therefore necessary to secure good setting. Where orchards are planted in large contiguous blocks there is a constant danger of short crops, owing to the number of insects being probably inadequate to perform the work of fertilization. This, however, may be easily remedied, as bees, which are most useful in this way, may be pressed into service, though the writer is inclined, from his

own observations in Northern Victoria, to attach much greater importance to those insects which frequent the blossoms about dusk than is usually accorded to them by horticultural writers.

THE WEATHER IN RELATION TO NON-SETTING.

Fertilization, as we have seen, is dependent upon the presence of insects, hence it follows that whatever tends to check their visits will injuriously affect the setting of the fruit. Wet weather has long been regarded as exercising a detrimental effect at this period, and many experiments have been made to test the truth of this. The general conclusion come to is, that whereas a few showery days may be regarded as of no importance, the setting is seriously interfered with by continued rainy weather, and chiefly because it prevents the visits of insects. Raspberries, however, seem little subject to injury from rain, for F. W. Card, of the Cornell University, U.S.A., reports good crops where the plants were sprayed with water during the whole of the blossoming period, about fifteen days.

Excessive moisture during the period of blooming greatly favours the growth of many fungi; the Twig Blight of the peach and the Black Spot of the apple under such conditions may enormously reduce the setting in those varieties subject to their attacks. These and other parasites, by destroying the foliage and weakening the tree, may also retard the formation of fruit buds for the following crop.

In this climate non-setting is rarely, if ever, due to winter-killing of the flower buds. Heavy frosts when trees are in bloom have a bad effect; one or two degrees below freezing point is the lowest temperature that can be withstood in warm climates, though in colder regions it has been found by Professor L. H. Bailey that peaches suffered no injury from 5 degrees of frost when in full bloom. The effect of frost, no doubt, largely depends upon the way in which thawing occurs; if rapid, the consequences will be much more serious than if proceeding slowly.

SELF-STERILITY OF CERTAIN VARIETIES.

So far consideration has been given only to causes affecting all fruits to a greater or less extent. But there are some varieties which fail to produce good crops under certain conditions, because they are self-sterile. By this is meant that the pollen from one tree is incapable of fertilizing the female portion of another blossom of the same variety, though quite efficient on a distinct kind. In those which are self-fertile, on the other hand, the pollen is able to fertilize other flowers of the same variety. When complete self-sterility exists, fertilization can only occur from cross-pollination; that is, the pollen must be derived from a distinct horticultural variety. But it is found that self-fertilization takes place in some degree in nearly all varieties, though the resulting fruits are rarely so large and the seeds generally fewer and smaller than in cross-pollinated fruits. These two divisions also tend to merge into one another, so that a variety under certain circumstances self-sterile may elsewhere prove sufficiently self-fertile as to yield fair crops even when secured against cross-pollination. In general, it may be said that self-sterility either shows itself or becomes accentuated under conditions not the most suitable to the variety in question. It is to the researches of Waite and Fairchild in America that our present knowledge of the problems in fertilization of the apple and pear is largely due. Others have followed similar lines of work with various fruits, but there is less certainty about the results obtained, and from the commercial aspect these are to local growers less valuable.

The Williams' Bon Chretien pear has been extensively planted in Victoria within the last decade, and especially in our northern districts. In many orchards no other variety has been grown, a result due primarily to the belief that this was the only profitable pear suited to the prevailing conditions. The unsatisfactory yields so often obtained are doubtless due to partial self-sterility, found to be a marked characteristic of this variety in the investigations previously referred to. In the following list the behaviour of some of our best sort to their own pollen is given:—

Self-sterile.

Beurré d'Anjou.
Beurré Clairgeau.
Easter Beurré.
Gansel's Bergamot.
Louise Bonne de Jersey.
Winter Nelis.
Williams' Bon Chrétien.

Self-fertile.

Beurré Bosc.
Duchesse d'Angoulême
Flemish Beauty.
Kieffer.
Le Conte.
Seckel.

With regard to the Kieffer, Duchesse d'Angoulême, and Seckel, it should be noted that in cold climates and in wet springs they are strongly inclined to self-sterility, though under more genial conditions abundant crops are borne, even when planted alone in large blocks. Cross-pollination usually takes place in average orchards to such an extent as to justify the conclusion that "the normal typical fruits and in most cases the largest and finest specimens from both the so-called self-sterile and self-fertile varieties are crosses." Hence cross-pollination may be regarded as a decided advantage with all kinds of pears.

SELF-STERILITY IN APPLES.

Much the same conditions have been found to exist in apples as in pears, though as a rule the differences in the behaviour of the varieties as regards fertilization are not so well marked. In apples, for some reason a larger selection is in general found in our orchards, and as they blossom later than the pears, and their flowers are particularly attractive to insects, cross-pollination occurs to a great extent without our knowledge. The inferiority of self-pollinated fruits is even more marked than with pears. In many characteristically self-fertile varieties it is found that fully three-fourths of the crops is cross-pollinated, and the self-fertilized fruits are, as a rule, much smaller, less highly coloured, and deficient in seeds. Among those most liable to non-setting through self-sterility may be classed the Rhode Island Greening, Esopus Spitzenberg, Gravenstein and Northern Spy.

OTHER INFLUENCES.

It is commonly said that this or that variety only bears a good crop every second year, though some growers maintain that this is due to faulty pruning. Strictly speaking, the trouble here does not arise from non-setting, but rather

from the sparse production of flower-buds. Over bearing in one season certainly tends to diminish the vigour of the tree, which in turn prevents the formation of fruit spurs, and also leads to self-sterility. The absence of flower buds is specially noticeable in young peaches and apricots that have the previous year borne crops beyond their capacity to properly mature. Whether this over-cropping of young trees tends to intermittent bearing in after years is still an open question, and one worthy of more attention. The common practice of irrigating just after a heavy crop has been removed has its origin mainly in the belief that the vigour of the tree is thereby increased, and the formation of flower buds assisted, and the chances of a good setting the following year improved.

PRACTICAL CONCLUSIONS.

Though we may not hope to control the influence exerted by the weather during the blossoming period, we are still able to prevent non-setting in so far as it is due to the other causes mentioned. It will be readily recognised that the planting of large blocks of single varieties of apples or pears is not a policy to be generally recommended. Though the tendency among those newly entering into the business of fruit-growing is mostly in the direction of planting too many sorts, the opposite policy of restricting the number is in some instances being carried too far for safety. Where large blocks of one variety exist and are found to do well in all respects save fruiting, a good plan is to graft every third or fourth row to some other kind, as the trouble probably arises from self-sterility. To secure cross-pollination under these circumstances, or in closely-planted centres, the keeping of a few hives of bees will prove of great value. Lastly, no measures should be neglected which are likely to produce an even growth from year to year if satisfactory crops are to be obtained.

A METHOD OF GRAFTING.

At the annual meeting of the Ontario Fruit-growers' Association last year, one of the speakers said that the old system of grafting was to put two scions in, one

Two cows, a Shorthorn and a Dexter-Kerry, were allowed to remain out of doors day and night during eight weeks, commencing on 15th June, and their yields were taken as a basis of comparison. During the first six weeks these two cows were not rugged, but during the fourth period they were rugged at night.

During the periods Nos. 1, 2, and 3, the cows were given 20 lb. oaten chaff and 1 lb. of bran per day, in addition to what grass they could pick up; and during period 4 the chaff was increased to 30 lb. per head per day.

TABLE OF COMPARATIVE RESULTS.				
Cows.	Basis for calculation.	Comparative Milk Yields for each Period, compared with No. 1, or Basis.		
	Period 1.	Period 2.	Period 3.	* Period 4.
1 and 2	Out and unrugged, 100.	Out and unrugged, 93.6.	Out and unrugged, 82.0	Out and rugged, 81.2.
3 and 4	Out and unrugged, 100.	Stabled, 100.	Out and rugged, 88.9.	Out and rugged, 93.3.
5 and 6	Out and unrugged, 100.	Out and rugged, 94.1.	Stabled, 88.5.	Out and rugged, 96.0.

* Extra food was given in Period 4.

The weather during the first period and the first half of the second period was dry,

cold, and frosty. During the latter part of the second period, wet, cold weather was experienced. The weather during the third and fourth periods was similar to that of the first.

Taking the cows in groups of two, and working on the averages, it is seen that the two cows which were out and *unrugged* for periods 1, 2, and 3 showed a shrinkage of 6.4 per cent. between the first and second periods, and a shrinkage of 12.4 per cent. between the second and third periods. The shrinkage between the first and third period was 18 per cent., while the shrinkage between the first and third periods in the case of the two groups which were sheltered by rugging and housing alternately was but 11.1 per cent. and 11.5 per cent. Then, taking the fourth, where all cows were under similar treatment (being out day and night and rugged), it is seen the shrinkage in the case of cows 1 and 2 was merely nominal when compared with the previous period. Thus the tide in the shrinkage was practically stopped; but how much was due to the rugging, and how much to the extra feed, it is not possible to estimate accurately.

Taking the results obtained from the other two groups, it will be seen from table that the two cows which were stabled in No. 2 period maintained the same yield as in period No. 1; but that during period No. 3, when these cows were turned out at night and rugged, a loss of 11.1 per cent. took place, and in period 4 gain occurred under the same rugging conditions, but with an increased supply of chaff.

Cows 5 and 6 seem to have done better when rugged than when stabled. The shrinkage between the periods 1 and 2 was the same as between 2 and 3; thus the cows fell off at the rate of nearly 6 per cent. in each period. The shrinkage was mainly due to the Kerry cow, No. 6, an animal that does not seem to appreciate stabling, because during period 4, when she was again put out and rugged, she increased very considerably, and much more than is attributable to the increased food supply. The gain in her case was 19 per cent. when the fourth period was compared with the third.

Looking at the results, it is evident that there is a considerable advantage in rugging or stabling when compared with ordinary out-of-door conditions of shelter. The comparison of results between stabling and rugging are not so conclusive. Cows 3 and 4 did better when stabled than when rugged, and showed less shrinkage for period 2 than cows 4 and 5, which at that time were out but rugged. It should, however, be borne in mind that during the second week of period 2 the weather was wet and cold, and hence stabling should be a great advantage. On the other hand, these results would go to show that when the weather is dry, though fairly cold, cows will do nearly as well when well rugged and turned out as when stabled at night. The cows will, however, consume more food because, though they may not get very much grass in a dry season at night, in winter, they will get some, and will probably consume more grass in the twenty-four hours than the cows which are stabled by night, and out on grass by day.

If each week be taken separately, and the third and second weeks be compared, some interesting figures are obtained. It will be noticed that all six cows were out day and night during the first fortnight, and that at the end of that time four of the cows were sheltered (two being rugged, and two being stabled at night). The two cows that were stabled at night responded to the better treatment at once, and showed a gain of 7 per cent. for the week, while the two cows that were rugged also showed a distinct gain, the increase being 3 per cent. The following week cold rain set in, and all cows fell off in yield of milk and butter-fat.

The following particulars of the individual cows will be of interest:—

No. 1 is a roan shorthorn cow on her first calf. She had been calved nine weeks when the test commenced.

No. 2 is an imported Dexter-Kerry cow, and a heavy milker. She had been calved six weeks on 16th June.

No. 3 is an imported Jersey cow, and a good milker. She had calved nine weeks when test commenced.

No. 4 is an Ayrshire on her first calf, and had been calved nine weeks on 16th June.

No. 5 is an imported Ayrshire, and had been calved thirteen weeks on 16th June.

No. 6 is an imported Kerry cow, and a heavy milker. She had been in milk seven months when the test began.

The following were the averages of fat per cent. yielded by the cows during the fourth week which was wet, and the fifth week which was mostly fine.

			Wet week. Per cent.		Condi- tions. week.	Dry Per cent
Cows 1 (Shorthorn)	O	...	3.3	..	O	3.4
" 2 (Dexter)	O	...	4.3	..	O	4.5
" 3 (Ayrshire)	S	...	4.2	..	R	4.5
" 4 (Jersey)	S	...	4.3	..	R	4.6
" 5 (Ayrshire)	R	...	4.5	..	S	4.4
" 6 (Kerry)	R	...	5.0	..	S	5.2

It is thus seen that no matter what the conditions were during the nights every cow, save one, showed a higher fat percentage during the dry weather than during the wet.

These results should encourage farmers to protect their milch cows from the wintry blasts.

The cows that were rugged and housed kept in very much better condition than those which were unsheltered.

Facilities for obtaining the weights of the animals were not available.

SHELTERING CATTLE IN MILD CLIMATES.

A similar experiment to this was carried out at Wollongbar State Farm, but, as might be expected, the advantages of housing or rugging in this semi-tropical region were not very evident. Of the cows that fed well through the experiment there appeared a slight advantage in stabling, but nothing commensurate with the extra expense. The temperature was seldom below 46 degs. F. at night at Wollongbar, the maximum for the day being about an average of 64 degs. F. At Berry, however, the temperature at night would frequently be 20 degs. F. lower than at Wollongbar.

Veterinary Departmental Report for December, 1902.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE---

I BEG to submit my report for the month of December on:—

Scab.—There has been a considerable falling off in the number of outbreaks during the month, and those under license for disease are now in a position to take energetic means for its eradication. Six outbreaks have occurred in the Colony during the month. At this time of the year there is no excuse for owners not cleaning their sheep.

Lungsickness.—In Natal there have been five fresh outbreaks during the month, three in Ladysmith district and two in Umsinga district. There are at present 26 herds under license in Natal, as follows:—Klip River, 11; Newcastle, 4; Umsinga, 2; Dundee, 5; Estcourt, 2; Lower Tugela, 1; and New Hanover, 1. In Zululand there are 48 herds under license.

Rinderpest.—In Natal two outbreaks have occurred, one at Umsinga and one at Krantzkop, and in each case the source of infection was Zululand. At the Umsinga outbreak the Natives refuse to inoculate, preferring to kill the animals as they became sick and eat them. In this way you will understand the outbreak is being considerably prolonged. At Krantzkop all the cattle have been inoculated. There have been no fresh cases for two weeks. There is still one centre of disease in Klip River Division, viz., at Modder Spruit.

In Zululand D.V.S Tyler reports that there is a decided decrease in the number of centres of disease. It has, however, extended to the Lower Umfolosi District on the Coast, having been carried there by the movement of stock. The chief obstacle in the suppression of this disease in Zululand is the movement of transport cattle. It is impossible to place serious restrictions on transport in Zululand, as the food supply of the country would be seriously interfered with. It is hoped

that the railway will be thrown open for traffic beyond the present terminus as soon as possible.

Glanders.—This disease is prevalent in Durban, 21 animals having been destroyed during the month. Cases have occurred more or less throughout the Colony, five animals having been destroyed outside Durban. It will be seen by D.V.S. Verney's report that the Remount Depot at Mooi River is still a source of infection.

Rhodesian Disease.—During the month I was absent from Pietermaritzburg some eighteen days on our Northern Border seeing that proper precautions were taken to guard against the introduction of cattle from the Transvaal, from Swaziland, and from Portuguese territory. These arrangements are complete, but cattle are still permitted to come to Charlestown (in yoke) for the purpose of loading goods there. As before pointed out, I think this should be prohibited. There are practically no cattle at present in the country close to our Northern Border, a few isolated Native cattle only being seen, and I think that we have a certain amount of security by reason of this scarcity of cattle in the vicinity of our Border. The nearest disease to us at present exists at Nomashane, Swaziland, which has been declared an infected area by the Transvaal Government, and the movement of stock prohibited. The Magistrate, Ingwavuma, is well advised as to affairs in Swaziland and Portuguese territory. I fear that the Border between Zululand and these countries is at present most threatened. The Magistrate, Mr. Armstrong, has, however, taken energetic measures to guard against the introduction of the disease over this Border, and any disease of a suspicious nature in the vicinity is most carefully looked after by him.

Quarter-evil.—This disease has been prevalent during the month in certain portions of the Colony. Twenty-six

deaths are reported from Western Umvoti.

Redwater.—Isolated cases of this disease have been constant throughout the month, and outbreaks of a most acute nature have occurred amongst herds of imported susceptible animals, with a heavy mortality. Allowing imported susceptible cattle to be conveyed by road through the Colony—which cattle will with certainty contract acute Redwater sooner or later, in many cases dying on the road while in Natal—is a distinct source of danger to stock-owners *en route*. It must be borne in mind that every case of an animal dying of acute Redwater increases the virulency of the infection in the locality. Such increased virulency is not of serious importance where one or so animals die, but where a number die of acute Redwater the veld may become seriously infected with a more acute form of the disease than existed before the deaths occurred, and thus be the means of causing mortality amongst local stock.

Contagious Ophthalmia of Cattle.—This disease has become very prevalent throughout the Colony during the past two months, affecting chiefly calves. Owners must treat this as a contagious disease, and isolate all affected animals where possible. In some outbreaks the results are serious by causing total blindness. D.V.S. Verney, in his report, gives a good formula for this disease. A solution of hyposulphate of soda in the proportion of 20 grains to 1 oz. of water, or of sulphate of zinc in the proportion of 6 grains to 1 oz. of water is effectual in the earlier stages of the disease. Both eyes should always be dressed whether they are both affected or not.

Mange in Horses and Goats.—This disease has greatly decreased during the last three months. Owners have taken more energetic measures of late, and the season of the year has had a considerable influence over it.

Anthrax.—Three outbreaks of this disease have been reported during the month. One in Klip River Division with 2 deaths, one in Umlazi Location with 11 deaths, and one in Umvoti County with 7 deaths.

Horsesickness.—A few cases have occurred in Durban.

Billiary Fever, or Malaria in Horses.—This disease has been very prevalent during the last month, particularly amongst imported horses, and in the vicinity of Pietermaritzburg. The disease appears to have become prevalent at the same time as ticks have appeared in considerable numbers.

I put up reports of the D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT,
P.V. Surgeon.

MARITZBURG.—D.V.S. FYRTH.

Scab.—There are no cases in either of the three Divisions.

Lungsickness.—No cases have occurred during the month.

Glanders.—Two clinical cases occurred in the Umgeni Division, and were destroyed.

Rinderpest.—No cases of Rinderpest have occurred up to date.

General.—Between the dates of December 2nd and 15th I acted as D.V.S. at Mooi River during the absence of D.V.S. Verney at Pietermaritzburg as Acting P.V.S. Whilst there one case of clinical Glanders was brought to my notice, and an in-contact horse which reacted to Mallein test was destroyed. On December 22nd I was called to Port Shepstone to a reported outbreak of Glanders. On my arrival I found a mule suffering from Catarrh, but, to make absolutely certain, I applied to the sick mule, whose low temperature (100 degs. F.) justified it, the Mallein test. I also tested the in-contact mules (36 in number), and none of the mules reacted in the slightest degree, including the suspicious case, which gave no reaction whatever. I therefore gave the owner permission to work the animals, and raised the quarantine.

HOWICK.—D.V.S. SHARPE.

Scab.—This disease is decreasing rapidly. Three flocks are under license in Impendhle Division, and no fresh outbreaks in Lion's River Division.

Lungsickness.—None.

Glanders.—I have had two cases, both showing clinical symptoms. One case was outside my district.

Rinderpest.—None.

Mange.—This disease is also on the decrease. Everyone is making strenuous efforts to stamp it out.

General.—There was a heavy mortality from Redwater in a troop of imported oxen trekking from Durban to Charlestown, about 60 dying during their stay at Nottingham Road. Stock generally continue healthy.

VRYHEID.—D.V.S. CROLE.

As these districts have not yet been properly taken over by Natal, and, further, as the laws relating to stock enforced in Natal do not obtain here, the work of preventing the spread of contagious diseases amongst animals has been most unsatisfactory.

Rinderpest had to be allowed to spread practically unchecked, with the result that it is generally prevalent in the north-eastern portion of the new territory, and also exists along the Zululand Border as far as the White Umfolosi. All that could be done in this relation was to collect a stock of bile at the Government File Station (De Jager's), and locally at the centre of the worst outbreak, viz., between Ngotshi and the Pongola River. Unfortunately, however, preventative inoculation with the bile thus collected and preserved could not be enforced. Directly Natal laws come into force here, it will be possible to deal with the epidemic in spite of its long reign of impunity.

Mange, equine, is very prevalent also, and, for the same reason as given above, runs unchecked.

Lungsickness.—Only one case of contagious Pleuro-Pneumonia has so far been reported (Inhlazatshi), but no doubt plenty of other outbreaks exist.

Verminous Pyelo-Nephritis.—An outbreak of this disease amongst the repatriation mules at Utrecht was investigated, and the water supply implicated.

Redwater.—The acute form of bovine Redwater is reported to have spread southwards through Swaziland to within less than a hundred miles from Vryheid.

Horsesickness.—Various forms of Horsesickness have already claimed victims at Vryheid, the Pongola, and Umfolosi. The chief difficulty that the D.V.S. here has to contend with is that the farmers are so loath to recognise that their bounden duty to the State compels them to report any outbreak of a contagious disease amongst their stock.

MOOI RIVER.—D.V.S. VERNEY.

During the first fourteen days of the month I was on duty in Pietermaritzburg, according to your instructions, and during that time nothing of a very important character occurred.

Scab.—There has been a considerable diminution in the number of outbreaks during the month.

Lungsickness.—No fresh outbreaks.

Glanders.—This disease is still very prevalent owing to the action of the Military in disposing of infected horses. I killed one horse belonging to Messrs. Abbot & Co. that showed well-defined Glanders, and another, the property of Mr. Van der Westhuzse. Both these horses came from the Military.

Dunsickness.—This disease, as expected, has shown itself again. Nearly all the cases in this district occur during the months of December and January. Nearly all horses affected are aged, and mares are for the most part the subject of the disease. In fact, some people think it is confined to mares, but this is erroneous. Either sex may develop this very fatal disease, provided they are allowed to run on the veld for a considerable length of time. It is quite safe to say that more horses are lost here from Dunsickness than the so-called Horsesickness. The etiology and pathology of the disease is still somewhat obscure, but I feel certain the disease is caused by something the animal eats on the veld, and that the causal agent is present during the early part of the summer. I feel certain that by proper experiments this something could be found out, and I would suggest that horses be fed on all likely looking herbage that can be found on the farms where Dunsickness is so constant and prevalent. The most constant post-mortem change is cirrhosis of the

liver (drunkards' liver), which has a characteristic granite-like appearance, and in a great percentage of cases the stomach shows impaction, but this is not always the case. The alteration in the liver and stomach, I think, are the cause of all the main trouble, interfering with the circulation. My experience is that all cases sooner or later prove fatal, but I am now hoping to try a new remedy which may have a beneficial effect.

Contagious Ophthalmia in Cattle.—This disease is again very prevalent, and for the most part confines itself to calves, but occasionally the disease shows itself in full grown cattle, and if not properly and promptly treated often results in the loss of one or both eyes. The disease is indicated by the part of the eye becoming cloudy in appearance, accompanied with a watery discharge, and, if the attack is an acute one, then the centre of the eye becomes ulcerated, and this is the dangerous stage which frequently results in loss of eyesight.

The best remedy I have found for this disease is the following:—

Silver Nitrate... grs. viii.

Extract Belladonna .. grs. vi.

Distilled Water oz. 1.

If a little of this be injected into the eye daily in the early stages it always has the desired effect.

Other cases have been of an ordinary nature.

LADYSMITH.—D.V.S. O'NEIL.

Rinderpest.—This disease seems to be dying out under the strict quarantine regulations that exist in this district, and up to date there are no fresh outbreaks to report.

Lungsickness.—There have been three outbreaks of Lungsickness in the Klip River Division; otherwise the rest of the district is free from the disease. It is my opinion that the disease has originated from old lungers, as the rest of the respective cattle in the different troops were inoculated without any losses.

Glanders.—This district has been free from Glanders-Farcy, and there has been only one suspicious case, which was isolated and put under observation.

Redwater.—There have been three cases of Redwater during the month.

Gallsickness.—There have been four cases of Gallsickness during the month, and the majority of the cattle succumbed.

Meltsickness.—Of this disease there have been three cases throughout the district, and the animals suddenly succumbed.

Mange.—This disease still exists amongst the horses in the different Divisions of the district, but they have been put under license, and there is a great improvement in the condition of animals throughout the district.

DURBAN.—D.V.S. AMOS.

The importations of live stock have been very large, chiefly for the Repatriation Commissions, and are as follows:—

Ewes	27,125
Wethers	6,971
Oxen	2,961
Donkeys	3,263
Mules	769
Horses	488
Rams	282
Cows	11
Dogs	7
Bulls	6
Calves	2

Total Importations 41,885

The ewes, which head the list for the first time, all came from Australia, and were only of a medium quality. They arrived in a thin condition, but were free from Scab.

The wethers were for slaughter, and all came from the Argentine.

The oxen were composed as follows:—2,259 from Madagascar, 684 slaughter oxen from America, 9 from Mombasa, and 9 from German East Africa.

The number of donkeys imported is the largest on record, and were brought almost exclusively for repatriation. Amongst them were some very fine donkeys, but, on the whole, were an average lot. A heavy mortality occurred on the voyage, due in most cases to abortion. Pregnant mare donkeys seemingly carry badly, and are prone to abortion. Another factor against these donkeys was

that they had to be carried right across the continent from the slopes of the Andes to Buenos Ayres to be shipped, and this killed many of them.

The mules all came from the Argentine, and landed well. Each animal was examined for Glanders, but no clinical case could be detected.

Of the horses, 326 came from Australia, chiefly South African Constabulary contract horses, 5 from England, and the remainder from the Argentine.

The rams came from Australia and New Zealand. The latter composed 100 good Lincoln rams, and landed well. The Australian rams were a poor sample of Merinos with a few nice Southdown amongst them.

Of the cows, 9 came from German East Africa, the other 2 from England.

Lungsickness.—I am glad to be able to report the Borough and County to be free from this disease, the last area under quarantine being released on December 5th. It is worthy of note that out of the 3,800 Australian heifers landed here in September and sent to Harrismith, 480 have died up to present date, and many of these deaths, I am told, are due to *Lungsickness*.

Horsesickness has been the cause of deaths in horses and mules at the Umbilo Camp. These animals are more or less exposed at night. I have heard of one other case in the Borough.

Tuberculosis.—No reactions have been obtained during the month.

Tetanus.—Three fatal cases during the month have been notified to me. All have proved fatal, and no treatment has been carried out as far as I can gather. I am sorry not to have been informed in time to use the anti-tetanic serum.

Glanders is by far the most serious disease I have to contend with. There has been quite a wave of this disease, and many clinical cases have been discovered and destroyed. The Eastern Vlei is undoubtedly grossly infected, and most outbreaks are traceable to this area. In consequence of this I am of opinion this place should be closed entirely for the feeding of horses and mules. It seems to be the place to turn

any diseased animals on to live or die, and as soon as you find a mangy or glandered animal there no one is the owner, and consequently you cannot bring the defaulter to law. I am extremely glad to say that at the present time I have one case of identity of a glandered horse on the Vlei, and proceedings are being instituted as soon as my evidence is completely confirmed, and I hope to make an example of this case. During the month 13 clinical cases and 8 reacted horses were destroyed; 135 animals have been tested, so my time has been fully occupied. As these and many more animals have to be tested again in the future, it is likely this disease will keep me busy for some time. Each outbreak has been specially reported to you. I am obtaining some very interesting data, which will furnish a special report later.

The disease of horses' coronets and pasterns, due to a necrotic organism, and common to the Eastern Vlei, has made its re-appearance.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak of a mild nature. There is very little of this disease at present in the district.

Lungsickness.—No fresh outbreaks, but the troop of Mr. J. C. Watt, of New Hanover, have been placed under a second license. The outbreak in this troop has proved most disastrous to the owner, no less than fifty head of cattle having died already from the disease and inoculation. A few were still sick at the end of the month, but it is to be hoped that the trouble is about at an end.

Glanders.—Mr. Purcell, of the Plough Hotel, Greytown, had an animal showing symptoms somewhat suspicious of this disease at the end of the month. On informing the owner of my suspicions, he very wisely had the horse destroyed at once rather than delay the verdict by isolating and testing him with Mallein. On *post-mortem* examination, I found the nodules of Glanders in both lungs. Seven other horses which had been on the premises for some considerable time, and which it was thought might possibly have

been brought into contact with the sick animal, were tested with Mallein, only one re-acting. This one had though, by the way, been standing next the one destroyed for some months. The manger has been burned, and the stable thoroughly disinfected, so that horse-owners need have no fear of their animals becoming infected when placed on these premises.

Rinderpest.—This disease has once more appeared in the district, having broken out in the Amabomvu Location, close to the Tugela River, three kraals being affected. As a special report was furnished to you on this outbreak, I think it unnecessary to give further details here. It is interesting to note that three head of cattle at one kraal and four at another, which salted naturally during the 1897 outbreak, were showing no symptoms of disease at the end of the month, while every other animal at the two kraals had become infected, proving them (the salted ones) to be still immune. The disease having recently existed on the other side of the Tugela, it is only natural to suppose that Zululand supplied the source of contagion.

Mange in horses is much less prevalent than a few weeks ago. It would be well for owners to remember that this disease is placed on the contagious list. In three cases proceedings are being taken against people who have ridden horses along the public road, and I trust this will be a warning to others.

Horsesickness.—A few cases of this disease have already been reported.

NEWCASTLE.—D.V.S. HUTCHINSON.

This disease continues to show marked improvement with regard to the control of contagious and infectious diseases in general.

Glanders.—Only one case of Glanders has come under my notice during the month. This case occurred at the Dundee Brickfields, and was the only animal kept on the premises.

Veterinary Reports 3

Rinderpest.—One case of Rinderpest exists in the Umsinga Division, and in this outbreak six animals have died. The disease was introduced from Zululand, but

the Stock Inspector has been unable to secure sufficient evidence against the Natives to warrant prosecution. These Natives refuse to have their cattle inoculated, and keep on killing them as they become affected.

A large amount of stock is at present leaving the upper part of the Colony for the Transvaal and Orange River Colony.

I am informed that the S.A.C. refuse to allow animals to cross the border unless owners of stock are in possession of a certificate of health from the Stock Inspector of the Division from which the animals have been removed. This greatly increases the work of the Stock Inspectors, but I do not anticipate that this extra demand upon their services will continue for any length of time.

Horsesickness.—Several cases of Horsesickness have already occurred in and around Newcastle. This is rather a serious outlook, as the disease does not generally commence before the latter part of February or beginning of March.

There is a considerable decrease in number of cases of Mange, but I anticipate a general recurrence of the disease during the forthcoming winter.

IXOPO.—D.V.S. POWER.

This district at present shows a pretty clean bill as regards contagious diseases, Scab and Mange being the only ones of a contagious nature.

Scab.—There is a decided improvement as regards this disease. No fresh outbreaks occurred this month, and four flocks were released from license.

Mange.—There is also a noticeable reduction in the number of mangy horses to be met with about the district.

I have been nearly all over the district during the month, and stock of all kinds are looking remarkably well, and have now quite recovered from the effects of the long drought.

Redwater.—In my last report I mentioned some cases of Redwater in imported cattle. I am glad to say that Mr. Vause's bull has made a good recovery from a very bad attack. Mr. Foster's young bull has not made very satisfactory progress.

While on this subject it is perhaps worthy of mention that some 20 head of young cattle were imported into this Division from the Argentine over two months ago and turned on to the veld at once, and so far, I understand, are doing well, only one case of Redwater having occurred. This, taking into consideration the time of the year, and the severity of Redwater this season, even amongst locally-bred cattle, is remarkably good. I am not yet in possession of all the details of this case, but I hope to see the cattle early this month and report more fully next.

Notwithstanding the many serious drawbacks to importing stock into this Colony, I hear that during the coming season more stock-owners of this Division intend going in for imported bulls, and certainly those gentlemen deserve every encouragement for their pluck and enterprise.

ESHOWE.—D.V.S. TYLER.

Rinderpest in Zululand.—Since my last report this disease has, on the whole, shown a decided decrease. Unfortunately, however, I have to report the extension of the disease to the Lower Umfolosi District, and this, owing to the number of cattle in this part of Zululand, is much to be regretted. As I have said in a previous report, whilst the transport is allowed to go on it is impossible to say in what new situation the disease will appear next, but of course complete stoppage of transport is out of the question owing to the food necessities of the country. An endeavour has been made in some districts to prevent the possible carrying of infection by trek oxen by prohibiting the passage of oxen from an infected to a clean district except a certificate is produced to show that they have been recently inoculated. A great many transport riders are extremely careless with their oxen, especially if animals have been inoculated some time previously. In the latter case it is seldom that one can persuade them to re-inoculate, even if it is months after the first inoculation, and when one assures them that the immunity

conferred by the latter has passed off. There has been a great difficulty of late in getting suitable men to take on the duties of inoculators, and I am of the opinion that it would be better to substitute Natives for Europeans to inoculate Native cattle. The Natives themselves prefer it; it would be much more economical, and, under the direction of a capable man, I feel sure that the system would be effectual.

I have had several opportunities lately of observing the effects of serum on a sick troop. I know of one herd of about 150 head which broke out with Rinderpest over two months ago. A dose of serum was given, and seemed to have good results on the healthy cattle in troop until about three weeks after, when they again broke down. This has gone on up to the present, a few cattle showing symptoms of disease; the herd was inoculated with serum and remained healthy for a period varying from one to three weeks, then again breaking down. Had a dose of bile been given with the first inoculation with the serum, the whole thing would have been finished ere this.

We are now meeting with cases in which breakdowns are occurring amongst cattle which were inoculated with bile about six months ago, as was to be anticipated. Given an outbreak in a country such as Zululand, where the population is almost entirely Native, one invariably finds a great reluctance to inoculate on the part of the Native until the outbreak has assumed considerable, and sometimes very large, proportions. In such cases Rinderpest is almost sure to be somewhere in the vicinity when the immunity possessed by the cattle first inoculated has passed off.

Victoria County.—I am glad to say that Victoria County has been free from Rinderpest for two months, and there have been no fresh cases since my last report for October.

Glanders in Zululand.—Since the end of October five horses have been destroyed as suffering from Glanders in Eshowe. They were part of the postcard stud described in my last report. One horse was

destroyed at Melmoth, and six others in the same stable were tested with Mallein, three giving a positive reaction.

A horse was reported to me by the Magistrate, Mahlabatini, as being sus-

pected of Farcy, but died before I had an opportunity of examining it. I went up and tested 15 horses which had been more or less in-contact, one reacting, and one proving doubtful.

Wheat Experiments.

THE following report by Mr. E. B. Griffin, of Misgunst, Willow Grange, to the Minister of Agriculture on wheat experiments is published for general information:—

Misgunst, Willow Grange,
December 30, 1902.

The Hon. H. D. WINTER, M.L.A.,
Minister of Agriculture.

SIR,—I have the honour of placing before you a short report of the three samples of wheat sent to me by your Department for trial last March. There was about 5 lbs. of each variety of the wheat, and which I planted on April 8th when I could irrigate and attend to it. For some reason or other the seed did not come up well, making a wretched show to start with, consequently the result is not so good as I hoped to get, having irrigated it twice during the winter. I reaped it on December the 5th. All had exactly the same treatment.

No. 1.—SPRING WHEAT: "MARSHALL'S No. 8."

This is a beardless variety, rather short in the straw, ear long and narrow, grain nice light colour, and rather plump (very similar to our Klein Corn in appearance). This wheat rusted rather badly just as the grain was getting out of the milky stage. From this sample I harvested 50 lbs. of clean wheat.

No. 2.—AUTUMN WHEAT: "BEARDED HARRISON."

This is a bearded wheat, as shown by the name. Straw long, short plump square ear, grain small and brown in colour, luxuriant growth, covers a lot of ground. This variety rusted very badly, starting just after the flowering stage,

affecting the grain very much as shown by sample sent. Yield, 120 lbs. Although this variety returned more in weight, the grain is poor, but there is no doubt that, given suitable conditions, it would return a very heavy crop.

No. 3.—WINTER WHEAT: "MEDIAN."

This is a bearded wheat. Very long straw with coloured knots, the ear taking the same colour, a greenish blue, a very pretty wheat. The ear is longish and well filled, corn large, long and brown in colour. I was very much taken with this variety, and it promises exceedingly well. No sign of rust, although standing adjacent to the very rusty piece No. 2. In my opinion, it should be an acquisition to our wheat-growing districts. This variety ripened about fourteen days sooner than the other, and returned me 50 lbs. weight of grain.

I am to-day sending by train samples of each kind in the sheaf and the corn as grown by me.

Should you require any of the wheat for further distribution and trial, I will be most happy to send you the half of what I have reaped.

Rats that infest ships are very cunning, and it is difficult to catch them. It is customary to bait the wire traps and tie them fast to prevent them from springing for two or three days. That is done until the rodents become bold and fearless. Then the traps are properly set, and a big haul of rats is the result.

The following are particulars of a gentleman's bill for posting with two horses and one postboy, from London to Dover, in the year 1827; the distance is 76 miles. Posting account, five stages, £5 14s.; to postboys (5), 18s.; turnpikes, about 10s.; total, 27 2s. This, of course, takes no account of food eaten by the way.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	W. Couch ...	Okehampton.
J. Button ...	Estcourt, South of Bushman's River	"	P. Ballantyne ...	Weston Town Lands.
		Lungsickness	A. Kruger ...	Twyfelfontein.
		"	J. B. Brewitt ...	Wagon Drift.
		"	E. R. Wright	The Alps.
J. J. Hodson ...	Lion's River ...	Scab	A. Sinclair ...	Craigdarroch.
		"	J. Ross ...	Gowrie.
		"	D. Connell ...	Vlaak Laagte.
K. Soutar ...	Portion of Lion's River	"	C. J. Smythe ...	Stratherne.
		"	J. Chadwick ...	Howard.
R. Vause ...	Ixopo ...	"	Dambuza ...	Claybrooke
		"	Shelana ...	Mackenzie.
		"	J. P. Vause ...	Thorninghurst.
		"	Inegwa ...	Columbia.
		"	D. Hulley ...	Eastwolds.
		"	C. D. Eva ...	Dronkvlei.
		"	Ikonyela ...	Springvale.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
R. J. Raw ...	Impendhle ...	Scab	Mahandan ...	Loteni.
		"	R. Gresham ...	Castle Howard.
		"	W. Harrington ...	Bentwood and The Rest.
		"	Nomandindi ...	Impendhle Location.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
W. Wilson ...	Ipolela ...	"	J. Hayes	Glengariff
		"	R. M. & D. Arbuckle	Costmore.
		"	J. Morrison ...	Glenmar.
		"	Earnshaw & Hilton	Pierremoot.
		"	C. A. Phipson ...	Strath Campbell.
E. J. B. Hosking	Upper Umkomanzi	"	J. Vanderplank ...	Lovedale.
G. N. Perfect ...	Umvoti, East ...	"	Thos. Hill ...	Stolzenvols.
A. S. Parkinson ...	New Hanover ...	Lungsickness	J. C. Watt ...	Newbrook
E. Varty ...	Umvoti, West	Scab	J. G. Nel ...	Elladale.
		"	E. Simkins	Holmesdale

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 69 herds of cattle under license for Lung sickness, and 11 flocks of sheep under license for Scab as under :—

Natal—Newcastle Division	...	...	...	4 for Lung sickness, 2 for Scab
Klip River	...	...	...	11 2
Dundee	...	...	...	4 6
Umsinga	...	...	...	2 —
Upper Tugela (North of Tugela River) Division	...	...	...	— —
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni	...	...	...	...
Districts	...	...	...	21 —
Nkandhla and Nqutu Districts...	...	...	...	21 1
North of White Umfolosi and Umfolosi Rivers	...	...	...	6 —
Total	...	...	...	69 11

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Modder Spruit.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District.

Umsinga Division.—Location.

Krantzkop Division :—Amobonvu Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 21st January, 1903.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of December, 1902 :—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised. tons. cwt.
	Above Ground.			Below Ground.			E.	N.	I.	
Elands Laagte	10	19	180	11	127	276	...	...	...	9,421 7
Dundee Coal...	15	14	120	15	94	363	1	15	50	9,211 5
Natal Navigation	21	43	165	16	240	81	13	22	...	7,004 0
St. George's ...	14	85	87	7	142	77	...	...	...	4,620 0
Natal Marine	7	64	9	8	217	5	...	...	...	4,304 3
Glencoe	10	41	64	9	119	16	5	12	1	2,185 17
No. 42	7	18	12	2	100	...	...	...	...	1,940 0
Newcastle	4	11	11	8	82	1	...	...	...	1,410 9
E. and W. Lennoxton	2	8	12	2	28	32	...	...	...	1,125 17
Crown	3	32	49	4	94	3	...	...	...	1,088 0
Bamsay	5	22	15	3	93	25	...	...	...	997 7
Natal Merthyr	1	10	4	2	28	4	2	12	0	669 6
Natal Steam	1	3	7	1	38	2	...	...	...	540 0
Central	5	25	2	1	35	1	...	...	...	510 2
Victoria Navigation	5	38	1	3	19	...	4	19	0	223 3
Total ...	110	433	738	92	1,456	886	25	80	51	45,250 16
Corresponding month, '01	106	450	584	71	1,285	840	...	...	...	49,411 12

New Campbell Colliery, no returns received.

CHAS. J. GRAY, Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of December, 1902 :—

Bunker Coal	...	...	...	...	...	tons. cwt.
Exported to :—	...	...	...	...	...	13,919 17
Cape Colony	...	...	...	...	...	10 13
Beira	...	...	...	...	...	59 11
Zanzibar	...	...	...	...	...	23 0
All Colonial Coal	...	...	...	...	...	14,013 1

Custom House, Port Natal,
January 3rd, 1903.

(Signed) W. L. HOWE,
pro. Collector of Customs.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 3a.—A Scotsman, 27 years of age, who has been in Natal 18 months; came out on account of his health; produces good testimonials from Home and Colonial employers. Wishes to learn farming; is prepared to give his services in return for his board and lodging for a few months.
- No. 13a.—An Australian, who has been serving throughout the war, is recommended with every confidence by his Commanding Officer. Asks for salary of £84 per annum.
- No. 17a.—Australian of 27. Has had considerable experience in New South Wales, and has taken sole charge of several sheep and cattle stations with credit. Produces excellent recommendations.
- No. 21a.—Applicant is 25, and of Scotch descent. Has had several years' experience as an overseer on a sugar plantation in the West Indies; is acquainted with book-keeping.
- No. 22a.—A corporal in the Imperial Yeomanry. Is 24, has had experience of mixed farming in England, and is prepared to accept an engagement on a farm in Natal.

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 29a.—A married man of 32. Was trained as a nurseryman in England; was engaged for three years upon forestry work with the Transvaal Gold, Land and Exploration Co., where he had entire charge of a plantation of 300 acres. Must have a living wage.

No. 30a.—Has had a number of years' experience of agricultural and stock farming in Umvoti County, and is prepared to take a situation as an assistant on a farm. Give good references.

No. 31a.—Is at present attached to the K.S.L.I., but is anxious to become an assistant on a farm. Is 27, and has had ten years' Home and Colonial farm experience.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of December, 1902.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same period from July 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	83.3	66.2	91.4	58.2	3.96	18	.96	20th	18.05	25.52
Stanger... ..	85.1	63.2	.99	.58	4.68	26	1.20	19th	22.03	23.86
Verulam	86.0	67.1	.95	.59	4.15	13	1.08	16th	17.89	21.48
Greytown	87.0	56.0	.93	.50	4.67	9	1.75	15th	13.81	21.34
Newcastle	91.1	65.5	.115	.52	6.33	15	2.52	14th	9.00	17.73
Estcourt	86.0	58.7	.100	.47	4.24	13	1.75	20th	10.83	13.96
Port Shepstone ...	85.4	60.9	.91	.52	3.51	11	.99	15th	21.36	30.96
Umzinto	87.8	61.4	97.5	.56	6.33	6	2.42	26th	23.82	20.16
Richmond	80.4	57.7	.1.1	.49	4.60	18	.76	19th	14.59	20.23
Maritzburg	83.3	58.7	.106	.50	4.03	19	1.01	26th	12.40	15.95
Howick... ..	81.6	56.3	.99	.48	3.88	18	1.12	27th	10.26	16.24
Durdee... ..	94.8	64.0	.98	.61	5.21	12	1.13	14th	8.73	19.01
Weenen	92.8	59.6	.106	.50	5.37	13	1.02	13th	10.72	12.35
New Hanover	85.1	59.8	.104	.50	5.54	19	1.34	15th & 19th	13.81	18.64
Mapumulo	81.9	49.2	.105	.32	6.95	17	1.56	16th	18.81	22.65
Nongoma	78.3	56.6	.87	.43	3.87	6	1.55	17th	...	16.18
N'Kandha	73.6	52.8	.92	.40	3.55	9	.90	16th	...	...
Qudeni	72.7	52.4	.89	.40	7.40	24	1.91	16th	21.13	29.82
Hlabisa	83.2	60.8	.96	.56	3.90	5	1.70	16th	...	20.10
Malmoth	80.8	60.0	.101	.52	2.29	13	.73	20th	12.18	17.02
Eshowe... ..	77.8	62.4	.101	.55	5.88	19	1.62	20th	24.52	24.48
Point ... ..	...	...	...	...	3.79	10	1.39	18th	...	...
Hilton Road	76.1	55.8	.100	.48	4.68	16	1.09	19th	...	...
Nqutu	79.7	48.5	.90	.38	3.22	14	.85	20th	8.22	...
Lower Tugela	82.4	63.8	.95	.58	3.99	16	1.17	20th	16.52	...

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—The drought is now making itself felt, and produce coming forward is not only of inferior quality, but is very deficient in quantity; in fact, it is a question if ever Maritzburg has had a worse season than the one through which it is now passing.

Mealies.—American mealies are now offering, and according to quotations from Durban, this arrival has caused mealies to be somewhat easier. Natal mealies are still worth about 22s. per muid.

Forage.—From 7s. 6d. to 10s. 6d. and 12s. per 100 lbs.

Hay.—It is a long time since hay has been so scarce as it is at present. During the past fortnight very little has been sold under 5s. per 100 lbs., and as much as 5s. 6d., 5s. 9d. and 6s. has been obtained. Bedding according to size of load.

Potatoes.—Not many coming in at present, and prices have fluctuated between 3s. 6d. (inferior) and 10s. to 12s. for good samples. There has been a heavy demand for imported seed, and stocks have been disposed of without difficulty.

Mabele.—Very scarce, and has realised from 10s. 1d. to 15s. 6d. per 100 lbs.

Onions.—From 4s. 3d. to 14s. 6d. per 100 lbs.

Butter.—Prices have been almost everything between 8d. and 2s. 2d. per lb.

Eggs.—Some samples have been as low as 1s. 3d. per dozen, others have realised 2s. 7d., 3s., and 3s. 4d. per dozen.

Lucerne.—From 2s. to 3s. 3d. per 100 lbs.

Poultry.—Common fowls, 1s. 6d. to 4s. and 4s. 6d. each; ducks, 5s. to 10s. per pair.

Sundries.—Beef, 5d. to 5½d. per lb.; mutton, 7d. to 10½d. and 11d. per lb.; pork, 6d. to 8½d. per lb.; rabbits, 9d. to 1s. each.

Vegetables.—Beans, beetroot, bringalls, cabbages, carrots, chillies, cucumbers, lettuce, marrows, green mealies, onions, peas, parsnips, radishes, rhubarb, and tomatoes.

Fruit.—Apples, bananas, grapes, granadillas, lemons, mangoes, plums, pears, peaches, and pineapples.

Firewood.—From 9d. to 1s. per 100 lbs.

DURBAN.—Mealies, 19s. to 20s.; forage, 7s.; mabele, 18s. to 21s.; potatoes, 13s. 6d. to 16s.; butter, fresh, 1s. 8d. to 1s. 11d.; pineapples, 6d. to 2s. 3d. per dozen; bananas, 2s. to 2s. 6d. per 100. Our usual special report by Mr. Edmonds is not forthcoming, owing to his place of business having been temporarily closed under Plague regulations.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1960 writes:—

The market is now well supplied with almost all kinds of vegetables; they command

very good prices, taking into consideration that the supply is so great. Fruit of all descriptions is coming in now from the Cape and Natal in large quantities.

Potatoes seem as if they will be a drug in the market soon. Large quantities are coming forward now from all sides, and we have a large local supply as well. The prices have come down about 10s. per bag all round on all classes the last two weeks.

Forage.—Still large quantities are coming forward, but prices remain firm.

Mealies, Kafir Corn, and Bran are in demand.

Poultry are still realising good prices, with the exception of turkeys and geese. The prices are as follows:—

	From		To	
	s.	d.	s.	d.
Barley, 163lbs..	14	0	16	0
Green Barley, per 100lb. bundles	15	0	40	0
Bran, 100lb. bag	12	0	13	0
Butter, per lb.	1	3	1	9
Kafir Corn, 203lbs.	30	0	32	6
Mealies (medium), 203lb. bag	20	0	24	6
Boer Oats (feeding), 133lb. bag	13	0	15	0
Oat Hay (best), 100lb. bundles	10	0	12	6
" 100lb. bales	9	0	12	6
Onions, 125lb. bags	17	6	19	0
Potatoes (best), 163lb. bags	22	6	30	0
" (medium), 163lb. bag	15	0	20	0
" (inferior), 163lb. bag	7	6	12	6
Eggs, per dozen (fresh)	4	0	6	0
" (imported)	1	6	2	0
Ducks, each	6	6	7	6
Fowls, each	5	4	6	10
Geese, each	6	6	7	6
Turkeys, each (hens)	7	0	10	0
" (cocks)	15	0	20	0
Firewood, per load	1	6	1	9

WOOL AND MOHAIR.

Mr. James Egner writes:—There have been no sales this week. Those of last week showed a firm tendency, the top price realised being the well-known clip of Mr. Lindsay which brought 8½d. This parcel was light and fairly well skirted. The bulk of the wools sold, of those offered, came from Griqualand East; they were anything but good yielding wools, and brought from 7d. to 7½d. Short wools fetched from 5½d. to 6½d. The wool season is now almost at the close. Encouraging cables are expected, and the tendency of this market continues firm.

Mohair.—The market is very poorly supplied, and the top price realised for good silky hair was from 11d. to 11½d., whilst matty and inferior ruled from 9d. to 9½d.

The Agricultural Journal

AND MINING RECORD.

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NOTICE.

The attention of Readers is called to the reduction in the Publishers' Prices for Reading Cases and for the Binding of Yearly Volumes.

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Paspalum Dilatatum.

AS will be seen by a notice elsewhere, the Department has another supply of *Paspalum dilatatum* seed for distribution in small quantities.

It is not yet two years since the Hon. F. R. Moor introduced this grass to the Natal farming community, and yet there are but few districts where it has not been experimentally tried. Unfortunately it only too often happens that certain

plants honestly boomed—from vegetables to trees—turn out to be failures when submitted to different soil and climatic conditions. A long list of such failures could be supplied by most colonists. Happily, so far, *Paspalum dilatatum* meets with nothing but approval. Reports from all corners of the Colony are satisfactory; not one of adverse character has been received by the Department. Some

reports go to show that *Paspalum* will not stand, in the coldest districts, the intense frosts of mid-winter, but even those reports speak favourably of the grass otherwise. With regard to the majority of the reports, it might almost be said that their eulogy is extravagant.

In standing cold, heat, drought, in weight of crop, in nutriment, in pasturing capabilities, in ease of propagating, and in the vigour with which the plant holds its own against encroachments of weeds and indigenous grasses, the testimony is overwhelming. Everything indeed goes to prove the accuracy of what Mr. Moor claimed for the grass. His views were communicated to the *Journal* of the 15th March, 1901.

Inter alia, Mr. Moor said:—"This grass is attracting attention throughout every part of Australia—in the rain belts and the drought belts, and in the hottest and the coldest districts *Paspalum* is thriving.

"All my enquiries and all my observations go to show that *Paspalum* will be one of the best grasses for Natal farmers to try. . . In New South Wales it is being extensively grown. At the Hawkesbury Agricultural College I saw a field of it. The soil was poor and shallow—ironstone and gravel over white pipeclay. It had been planted some eight months and was doing well. Already it has been grazed by sheep and it was making big growth. The head of the College told me that it was very popular among farmers, and that its cultivation was spreading in every direction.

"In Queensland, at Brisbane, I saw a plant of the grass in the Acclimatisation Gardens surrounded by exotic grasses. At the time of my visit the country was suffering from the severest drought ever known. The *Paspalum* was making good growth, while the surrounding grasses were either dead or dying. At the Gatton Agricultural College, in the same Colony, I also saw it. The soil here was rich alluvial, and the growth was magnificent."

In starting the grass from a small quantity of seed, it is advisable to sow in drills in a well-prepared seed bed. If sown broadcast there is difficulty in weeding, for the young *Paspalum* is not easily distinguishable from indigenous grasses. If there should be but little rain, watering should be frequent. Owing to irregularity in ripening, all *Paspalum* seed contains a varying quantity of seed that is infertile, but if the care, desirable for all small seed, be given, the percentage of plants will be good. Each plant is divisible into a great number of rootlets, and these rootlets may be dibbled out where wanted two, or preferably, three feet apart.

Enquiries were made some time ago as to the advantage of cultivating *Paspalum* for hay for sale on the market. The advantages were represented as great, and especially so in dry seasons. The quality of *Paspalum* hay is excellent. Compared analytically with English meadow hay, which is commonly taken as the highest standard of hay, the *Paspalum* shows a higher albumenoid content, the amount of digestible fibre being almost identical.

Mapstone Oats.

The following is published for general information:—

Leckhampton, Inchange,
January 15th, 1903.

THE MINISTER OF AGRICULTURE,
Pietermaritzburg.

SIR,—I am forwarding by rail, consigned to you, 20lbs. Mapstonian Oats, from crop grown at Inchange, from 20lbs. of

seed supplied last March. I beg to report as follows:—

Seed supplied was very light and poor; 20lbs was planted on a plot of land 24 x 133 yards, which received a dressing of 2 cwt. Thomas' Phosphate, and 2 cwt. Kainit. Nature of soil, sandy loam. The remainder of the field was planted with Algerian Oats, not manured. The Map-

stone Oats rusted very badly, but came into ear. The crop, however, was very light and unsatisfactory, viz., 25lbs. oats, and 500lbs. straw. The Algerian adjoining was almost free from rust, and gave a

return of 1,900lbs. clean forage average per acre. This was less than half the yield from Algerian the previous year, and was due to drought.—I am, &c.,

EDWARD E. DOWNING.

Carob Tree (Locust Beans).

IN connection with the correspondence published in the *Agricultural Journal*, pages 632 and 649, it is now intimated that, for the seed supplied to Government by Mr. Joseph Baynes for free distribution, only a few applications have been received, and seed is still available if others wish to obtain a supply.

Government is taking steps towards the importation of fertile trees for grafting from, and plants intended for grafting should be sown now.

Address applications to the Conservator of Forests, Pietermaritzburg.

The Drought.

THE drought continues practically unbroken. Local showers have fallen, but there has been no general rain. Along the railway line from Hilton onwards the grass is short and brown, and the mealie crops are stunted and unthrifty. Mr. Archd. Pearce, writing from Hilton, says that the rainfall for the last month was the lowest for the past thirteen

years, and Mr. J. R. Blamey, of Clairmont, writes: "I don't remember a January like this for the last fifty-three years in Natal." The last two columns in the Meteorological Returns published in this issue strikingly show how small has been the rainfall for the last seven months, in comparison with that of the previous corresponding months.

District Reports.

HOWICK, 28th January.—The weather since 1st inst. has been exceedingly trying owing to the continuous excessive heat, rain having fallen in very small quantities on twelve days only, registering the small total of 1.73 inch. The maximum temperature during the above period was 98 degs., registered on the 4th and 12th inst., and the minimum during the same period was 51 degrees, registered on the 14th inst. The continued drought is causing affairs to assume rather a serious aspect, and, unless things undergo a considerable change for the better, there will be an entire absence of crops in the south-western portion of the Division. In the upper District things are a little better, owing, no doubt, to the wet mists which are so prevalent in those parts, also storms which on two or three occasions which have followed the watershed of the Mooi River

and the Upper Karkloof. A heavy gale and hot north wind which occurred on 25th inst. proved very detrimental to crops, especially to fruit, among which it played havoc. The local grain supply is, and has been for some time, deficient, especially among the Natives, whose crops last year were not of the best. These people are already beginning to feel the dearth of food, and, strange to say, are actually beginning to leave their kraals to work. Stock throughout the District is in the pink of condition, and a large amount of cream and butter is being produced. Mange, which was so prevalent among horses, is fast disappearing, and, with the exception of a few cast military horses and loot horses, this class of stock is in good health and condition, the much-dreaded horsesickness not having put in an appearance as yet, though the farmers in the Karkloof Valley are daily

expecting it. On the whole the health of the District is good, both among Europeans and Natives.

J. W. CROSS, Magistrate.

IXOPO, 29th January.—During the last fortnight nice rains have fallen, but the crops are very backward this season. Stock of all descriptions are doing well. There are swarms of locusts in the St. Faith's District. Several severe storms have occurred recently, the lightning killing two Natives near Dronk Vlei, one near Pungatshe and one at St. Faith's, and also huts have been burnt down and one horse and two dogs killed.

FRANK E. FOXON, Magistrate.

NEW HANOVER, 3rd February.—Instead of the rains usual at this season there have been only fogs here. Our last rain we had on the 31st December, 1902, and there is very little hope of any crops for this District.

A. RITTER, Magistrate.

UPPER TUGELA, 16th January.—The drought having at last broken, farmers and Natives are busy ploughing with a view to the off chance of getting a supply of mealies up before the frost. The Natives, with their usual improvidence, have sold all their last year crops, and are now wondering what they will do for food if the mealies just sown do not come up. Vegetables are scarce, which may account for minor illnesses among the Natives. Several thousand sheep passed through the township about a week ago on the way to the Berg, and yet I understand goats are frequently killed as a substitute for mutton in this District. It is to be regretted some enterprising farmer does not kill regularly, so that the inhabitants of the township could be certain of an even supply of meat; as it is, meat has to be obtained from Ladysmith, which, besides the risk of arriving in an unfit condition for consumption, is frequently put out of the cart at some intermediate station, and costs a penny per pound for transport. It is difficult to get anything to grow, owing to the rocky nature of the ground, but I am sure that certain trees of a hardy nature would prosper here, and I should be pleased if the Editor of the *Agricultural Journal* could suggest the names of some, so that I may requisition the Government to supply them. The mill for pumping water is a great acquisition, but it is open to doubt whether placing it below the township instead of above will not eventually, as the population increases, prove a source of danger to the consumers of the water pumped up. The country is looking very green just now, and as the treacherous barbed wire entanglements have been removed, more like its normal state. There is some fairly good fishing in the Tugela, and I should be glad to receive a supply of

American Rainbow Trout fry to be distributed between the junction of the Sandspruit and Tugela River and the drift above the bridge. I have noticed a few buck between the Upper Tugela and Acton Homes, and I hope they will be given a chance to breed, so that they will be as plentiful as they were before the military slaughtered them, quite regardless of the restrictions laid down in the Game Law. Last week a very large swarm of locusts passed over the township, but so far little damage has been done. Mr. Fred Zunkel lost a field of mealies through these pests.

W. G. WHEELWRIGHT, Magistrate.

Agricultural Shows.

Himeville, Friday, 3rd April. Entries close 16th March; late entries 2nd April. Henry C. Gold, Hon. Secretary.

Greytown, Thursday, 14th May. Entries close 25th April. W. H. Gibbs, Hon. Secretary.

Estecourt, 3rd and 4th June, 1903. E. Catherley, Hon. Secretary.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries close 4th June; late entries 11th June. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Noodsberg Road, 6th August. Entries close 25th July. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Greytown Horticultural Society, Thursday, 12th February. Entries close 11th February. J. M. Handley, Hon. Secretary.

Polela Horticultural Society, Thursday, 19th February. Entries close 7th February. H. J. Gazzard, Hon. Secretary.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

MEETINGS OF AGRICULTURAL SOCIETIES.

Noodsberg Road, at Green Branch Hotel, 18th February, 10 a.m.

Klip River, at Town Hall, Ladysmith, 28th February, at 10 a.m.

A writer in the *Sportsman* some years ago attributed the hardness and soundness of the wild horses on the South American Pampas to the fact that the mares rarely drop their foals before the spring month of October, at which time the grass is coming on nicely for the youngsters. Foals dropped in August and September have to face sharp frosts, cold winds, and heavy rains.

Garden Notes for February.

By W. J. BELL, Florist and Seedman, Maritzburg.

EARTHING CELERY.—This is best done in three times at intervals of a fortnight, and when the plants are perfectly dry. The main crop should soon be ready for the first earthing; all small leaves and shoots should first be pulled away, and the tops drawn lightly together with a piece of matting just under the green leaves; this must not be tied low enough or in any position that will cripple the growth of the young heart of the plant, as it should remain on until after the second earthing. If worms and slugs are likely to be troublesome a good dressing of lime should be given before any soil is placed around the stems. If any more water or liquid manure is likely to be required, it should be given a day or two before commencing to earth. If any heads are required for show, it is well to wrap them round with brown paper before any soil is heaped against them. As a further preventive against discoloration by insects, etc., care must be used not to earth too deeply the first time; the young leaves should be able to continue their growth freely, the soil should be broken up small with the spade and pressed around the stems, the great point to aim at, in order to have it well blanched and of good flavour, being to exclude the air from the stems as much as possible, and this applies more especially to the later earthings.

STRAWBERRY PLANTS.

Old Strawberry plants which have done bearing, and which are not considered worth retaining, should be grubbed up, and the ground cleared. The same site may be manured, dug, and planted again if desired, but it is always better to have a change of ground. As the layered runners are now ready for setting out, preparations should at once be made, and the ground manured, dug, and allowed a few days in which to settle before the planting is done.

In selecting a site for Strawberries, it is always best to choose a piece of ground where the soil is of rather a heavy nature, but not too wet; but if such cannot be had, and the soil is of a light nature, the

same can be made much more adapted for the purpose by applying a heavy dressing of good sound loam, which should be dug in, and well incorporated with the soil. For light soils a dressing of loam is far preferable to the application of large quantities of manure. Soils of rather a heavy nature should be liberally, but not too heavily, manured, and even then a light dressing of loam is beneficial, especially if the staple soil is of rather a scanty nature.

THE FLOWER GARDEN.

Roses.—Any budding that yet remains to be done should be pushed forward. Where this work was begun in good time, the earliest buds inserted had better be examined and the ties loosened where necessary, neglect in this matter often resulting in injury to the swelling buds. Look over Tea Roses and strong growing varieties that are trained against walls, pillars, or trellises, cutting out all weakly and superabundant growths, not forgetting to tie or nail in the strongest shoots as often as becomes necessary, not overcrowding them, but allowing space for proper development. If mildew has made its appearance, no time should be lost in checking its course. Mildew compositions may be obtained from most seedsmen. Cut off seed pods; and pull up all suckers from Manetti stocks.

Carnations and Picotees.—Layering of these must now be carried forward, and for this purpose use a compost consisting of three parts loam, one of silversand, and one of leaf-mould, the whole to be passed through a fine sieve previous to using it. The operations of layering, it may be stated for the benefit of the inexperienced, consists of pinching off the bottom leaves from the strongest shoots of the current year's growth; cut off also the points of the leaves; afterwards spread in between and round the shoots a 2-inch thickness of prepared compost, press down moderately firm, and with a sharp knife make a clean cut half-way through a fully developed node or joint, the knife entering just below, and drawn upwards in a slanting direction so as to form a tongue, then with a short hooked peg secure in

proper positions the young shoot in prepared compost, adding another inch, or half inch, of the latter over the base of the layers. Should dry weather be experienced afterwards, they must be kept watered through a fine rose watering-pot till rooted. Weak growing varieties are best propagated by cuttings put in well-drained clean 5-inch pots, and shaded from bright sunshine.

CHRYSANTHEMUM RUST.

The remedies where plants are already infected is to gather and burn every diseased leaf at this time of the year. All such leaves should be burnt. If every leaf is gathered and burned the grower will then be quite free from the pest. After cutting down the plants, and before taking the cuttings, spray the latter with a solution of potassium sulphide—half an ounce to the gallon. Procure the sulphide (known as “liver of sulphur”) and dissolve in quart of hot water. When dissolved make up to a gallon with cold water. This will destroy any spores

present. As a preventative, spraying with the above may be done several times early in the season, and a careful search should be made for the first signs of an attack. If found, isolate the plant or plants, pick off and burn the infested leaves, and spray or sponge the remainder. If persisted in the pest can be stamped out, and need not be reintroduced if the same precautions are taken with cuttings obtained from other sources.

DAHLIAS.

Dahlias should have the leaders tied to their supports as fast as growth is made, and at the same time cut out any weak and spindly shoots that may be growing out near the base of the plants. From this time onwards, earwigs will be a great pest among these; a good method of trapping them is by placing, at intervals, beanstalks cut into 6-inch lengths, and placed among the branches; these should be examined every morning. Small flower-pots with a little dry moss or hay inside, and placed on the top of the stakes, may also be used.

Weekly Rinderpest Report.

UP TO 3RD FEBRUARY, 1903.

Umsinga Division.

Location.—Manyangunga: 4 deaths; no fresh cases.

Ladysmith Division.

Modder Spruit.—1 dead, none sick.

Krantzkop Division.

Amobonvu Location.—1 dead, 1 sick.

Zululand.

Eshowe District.—44 dead, 46 sick.

Mahlabatini District.—15 dead, 6 sick.

Umlalazi District.—16 dead, 10 sick.

Lower Umfolozi District.—No report received.

Ndwandwe District.—31 dead, 40 sick.

S. B. WOOLLATT,

P.V. Surgeon.

3rd February, 1903.

Fattening Chickens.

THE Canadian Government, says the *Prairie Farmer*, with its characteristic foresight and solicitude for the welfare of the farmer, has undertaken the development of the chicken fattening industry. There are now started, under the direct supervision of the Federal Government, some six fattening stations in

Prince Edward Island which began operations 10th September, and it is expected some 500 to 1,000 chickens will be fattened in each of the stations. Three lots of chickens will be fattened at each station, four weeks being allowed to elapse between each two lots, and it is expected that some 15,000 chickens will be fattened

this year at these stations, if suitable birds can be obtained. These stations will buy every chicken, suitable, which the farmers have to dispose of. This is a new avenue of industry for the farmer, and Professor Robertson, who is at the head of the movement, prophesies that in five years the chicken fattening industry will equal, if not overshadow, the great dairy industry of the Province. The British market will take at profitable prices a large number of fattened chickens, and different home markets are taking them at a premium of several pence a pound, dressed, as for the English market, because they supply, weight for weight, three times as much edible meat as do lean chickens. All the flesh of fattened chickens is of superior quality to that of common, lean chickens. By leaving the blood in the chicken's neck, and not drawing the chicken, the flesh is rendered more juicy and rapid decomposition is prevented.

A weight of four pounds is preferred by the British, but plump chickens of five pounds weight are readily taken. This undertaking is already creating a brisk demand on the farmer for chickens three to four months old. For the fattening process, the chickens are confined in crates. These are 6ft. long, 16in. wide, and 20in. high, outside measurements. Each crate is divided by two tight wooden partitions into three compartments, and each compartment holds four chickens. The frame pieces are 2in. wide and seven-eighths of an inch thick. This frame is covered with slats running lengthwise on three sides—bottom, back, and top—and up and down in front. The slats for the bottom are seven-eighths of an inch wide and five-eighths of an inch thick; the back, fronts, and top slats are the same width, but only three-eighths of an inch thick. The spaces between the slats in front are 2in. wide, to enable the chickens to feed from the trough. The bottom slats are put on one and three-eighths inches apart, and the slats nearest the back of the crate are two and one-quarter inches from the corner piece. The bottom slats are raised 2in. from the bottom of the crate, to prevent the chickens' feet from being bruised when the crate is

placed on the ground. The top slats are 2in. apart, and the back slats are one and a half inches. The top slats are cut above each partition, and six strips, 2in. wide are nailed under them. The doors, three in number, are so formed that they hinge to the rear of corner piece.

The crates are placed on stands 16in. from the ground. The droppings from the chickens are received on sand or other absorbent material. A light "V" trough, two and a half inches inside is placed in front of each crate, and is carried on two brackets nailed on the ends of the crates. The bottom of the trough is four inches above the floor, and the upper inside edge is two inches from the crate. In warm weather the crates are placed outdoors in a sheltered position. In unsettled weather they are placed under a board shed or carried into a barn. In cold weather a warm building is used. When fattening chickens inside a building it is advised that there be blinds covering the windows, which should be raised at each feeding time, and lowered when the meal is finished. Abundant ventilation is also urged. It has been determined that four months is the most profitable age to commence fattening, but suitable market chickens up to seven months old will show satisfactory gains in the crates. In fattening 100 chickens for market, eight fattening crates are required. These cost from £1 12s. to £2 10s. Eight shipping boxes, lined with parchment paper, cost 6s. 3d. The crates can, of course, be used over and over again.

Experiments made by Professor Robertson show that 365 chickens in five lots gained, on the average, 2.35lb. each, and the average cost of food consumed was 2½d. a lb. of increase in live weight. The ground gain was valued at 5s. per cwt., and the skim milk at 7½d. a cwt. The chickens should remain in the fattening crates for a period of twenty-four days. This period is best divided into two periods. In the first two weeks the ration is ground meal and skim milk mash, and in the second period tallow is added to the food. Lice must be warded off or killed, and for this sulphur is

dusted on the chickens before being placed in the crates, to kill all lice.

Cramming machines are not necessary for fattening chickens. When young chickens are placed in the fattening crates in a moderately lean condition, and are fed suitable fattening food from the feed troughs, they will make substantial gains throughout the fattening period. Feather

plucking in the crates must be watched. The remedy is to remove the chickens that are affected, and to feed the others more skim milk in their mashers, or to add animal or vegetable food to their fattening rations. When caused by parasites, the remedy is to apply sulphur and lard ointment to the affected parts.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 3a.—A Scotsman, 27 years of age, who has been in Natal 18 months; came out on account of his health; produces good testimonials from Home and Colonial employers. Wishes to learn farming; is prepared to give his services in return for his board and lodging for a few months.
- No. 13a.—An Australian, who has been serving throughout the war, is recommended with every confidence by his Commanding Officer. Asks for salary of £84 per annum.
- No. 17a.—Australian of 27. Has had considerable experience in New South Wales, and has taken sole charge of several sheep and cattle stations with credit. Produces excellent recommendations.
- No. 21a.—Applicant is 25, and of Scotch descent. Has had several years' experience as an overseer on a sugar plantation in the West Indies; is acquainted with book-keeping.
- No. 22a.—A corporal in the Imperial Yeomanry. Is 24, has had experience of mixed farming in England, and is prepared to accept an engagement on a farm in Natal.
- No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practices. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.
- No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.
- No. 29a.—A married man of 32. Was trained as a nurseryman in England; was engaged for three years upon forestry work with the

Transvaal Gold, Land and Exploration Co., where he had entire charge of a plantation of 340 acres. Must have a living wage.

- No. 30a.—Has had a number of years' experience of agricultural and stock farming in Umvoti County, and is prepared to take a situation as an assistant on a farm. Give good references.
- No. 31a.—Is at present attached to the K.S.L.I., but is anxious to become an assistant on a farm. Is 27, and has had ten years' Home and Colonial farm experience.
- No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.
- No. 40a.—Aged 26, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barberton District of Transvaal. Is anxious to get work, irrespective to nature of employment.
- No. 41a.—Gentlemanly young man of 22. Has slight knowledge of Viticulture. Is anxious to acquire knowledge of agricultural and stock farming. Appears energetic, and would doubtless be of great assistance to a progressive farmer.

Potatoes form the world's greatest single crop, 4,000,000,000 bushels being produced annually.

A sheep stealer met his death in a curious way in the year 1801. The man, William Hathaway by name, made his raid on the fold one dark night, caught a sheep and, having tied its four feet together, put the animal on his back, with the feet pressed against his forehead for convenience of carriage. He had to climb a high gate on his way home, and rashly attempted to do so without putting the sheep over it first. In climbing over he slipped, and the jerk shifted the tied feet from his forehead to his throat; the sheep hung on one side of the gate and its weight held the unfortunate man by the neck so firmly against the top bar that he could not release himself; and in this position he was found in the morning, having died of strangulation.

The Dairy Herd : Its Formation and Management.

THE following article is written by Mr. Henry E. Alvord, Chief of Dairy Division, Bureau of Animal Industry, U.S.A. Much of the article applies only to dairying under the conditions of an advanced community. All readers of the *Journal* of Colonial experience will immediately see where local conditions give no chance for the recommendations of Mr. Alvord. Such readers will also take into consideration the differences in seasons, climate, etc. The principles, however, ably stated, apply everywhere, and, if the eminent position of the dairying industry presented by the author is yet out of reach of the South African Colonist, it is a position to which he has of late been making big strides, and may some day closely approach, even if he does not actually reach it :—

The pursuit of dairy farming depends for its success upon certain fundamental conditions. First, the owner of the business himself, or otherwise the agent or manager who has the immediate control and personal direction of the work, must have a natural fondness for animals, prompting to generous and kind treatment, as well as good judgment in selection, breeding, and care. It is not sufficient that he should be a horseman, or fond of cattle in general; for best results he should have a special liking for the dairy cow, over and above all other animals. Second, the cattle must be good of their kind and of a variety suited to the work. They must be truly dairy cattle; but of this more presently. Third, the farm should be specially adapted to the branch of husbandry in view. A good dairy farm is pretty certain to be good for general farming, but many good farms in general are not suited to dairying. The dairy farm should be carefully selected, all the requirements of the business being well considered. Yet many disadvantages so far as the farm is concerned may be successfully overcome by the skillful dairyman, and dairying in some forms is profitably conducted without any farm, so that this condition, important as it is, cannot be regarded as essential. Fourth,

it is well to study the character of the accessible markets and the means of communication; location and the line of dairying to be followed may be largely controlled by the markets. In some cases the markets form an essential condition, but modern facilities for transportation make the location of the dairy farm with relation to its markets comparatively unimportant. The first and second above remain as the essential factors—the owner and the cow. Assuming that the dairyman is all that he should be, it is proposed to consider in the following pages the dairyman's main stock-in-trade, upon which depends his success—the dairy herd, its formation and management.

Like almost all other occupations at the present day, dairying has become divided into several distinct and special lines. These differ mainly as to the form of product and the manner of disposing of it. Milk or cream may be produced for delivery to consumers, and this delivery may be direct or indirect. The same products may be delivered to a factory for manufacture into butter or cheese, or the milk product of the herd may be worked up at home and there converted into butter or cheese. The prudent dairyman should first consider which line of business he will pursue. In so doing he must have regard for all his circumstances—the location, markets, farm, buildings, water and ice supply, the labour at his command—and his own preference, and prospects for profit. Upon his decision as to the particular kind of dairying to be followed should depend the character and composition of his herd of cattle.

CATTLE FOR THE DAIRY.

Dairymen are divided in opinion as to the kind of cow which is most profitable. Some prefer a "general-purpose cow," being a member of a specially developed milk producing family, from one of the beef breeds or grades of such stock. An animal is thus secured which has a large frame, is easily kept in good flesh, and fattens soon when not milking heavily such an one also has large calves, profitable

for veal or for growing as steers. Even if such animals are not so productive while in the dairy, their meat-making proclivities may make up for it. There are two or three of the established breeds of cattle which claim to possess combined qualities for meat and milk. On the other hand, many dairymen (including the writer) prefer cattle of the distinct class or type especially adapted to dairy purposes alone. This class includes various families and breeds, all having the marked characteristics which distinguish the milk producer. Owners of such cows expect them to be so profitable as milkers that their beef-producing quality and the final disposition of their carcasses may be entirely ignored; and the calves, except so far as wanted to raise for the dairy, are given little consideration. Which of these lines of policy should be pursued every dairyman must determine for himself. To succeed in his business he should select his herd or its foundation with a view to profit. Whether he should buy, breed, and feed his cows, having in view only their dairy products and capacity for reproduction, or whether he will find it more profitable to include the items of beef and veal, must be largely determined by home productions.

SPECIAL ADAPTATION.

Within the general class of dairy cattle one can find great variety, and can therefore select breeds or families well adapted to the special needs in view. Some dairy cattle are noted for the quantity of milk they produce; others for the high quality or richness of their milk, which means butter producers. Some combine quantity and quality in a specially economic way, under some circumstances. There are cows of active habits, which forage well on a wide range of scanty pasture, and will profitably work up the coarser kinds of food in winter. There are others which have proved their capacity for making good returns when most closely confined and subjected to high feeding. Some cows give a great flow of milk for a comparatively short season, and others are noted for an even, steady yield of milk the year through. The dairyman can easily find cattle, therefore, adapted to his particular wants. As a rule, the different dairy

characteristics named pertain to different breeds, so that every dairyman is likely to find some one breed of dairy cattle better suited to his wants than any other.

This is not the place to revive the never-ended "battle of breeds." No matter how strong one's convictions, discretion must be exercised. Pronounced opinions and direct advice as to the several recognised dairy breeds are here unnecessary. Evidence abounds on every side, and every dairyman that is, or is to be, can satisfy himself as to the cattle he should adopt, if he will but make a proper study of the subject. He need not go far in this country to find the best kind or breed of cows for milk supply, the best for butter-making, or the best for the cream trade. There is no special cheese-making cow; the best butter cow is also the best for cheese; this fact has been demonstrated beyond dispute.

FORMATION OF THE DAIRY HERD.

There are two very different ways of forming a dairy herd, and of maintaining its size and quality. It may be done by buying or by breeding, and these two methods may be combined. The purchasing plan is practised to a considerable extent by those who produce milk for town and city supply. In a few cases it has been known to be successful where the work of the herd was to make butter. Applied in its extreme form, cows are bought when mature and at their prime, judged almost exclusively by their milk yield, are highly fed so as to keep steadily gaining in flesh, and are sold, usually to the butcher, as soon as they cease to be profitable as milkers. The bull may be of any kind so long as he gets the cows in calf, and the calves are valued only as causing "fresh" cows, and are dispensed with as soon as possible. The first modification of this system is to keep extra good cows for several seasons, and the next to raise heifers from some of the best milkers to replenish the herd. This way of making up a herd and keeping good its numbers requires abundant capital and rare judgment in buying and in selling. It cannot be recommended to one lacking experience, and even the shrewdest buyer runs great risk of bringing disease into his herd.

The other extreme is to begin with a few well-selected animals as a foundation, and gradually build up the herd to the size desired by judicious breeding and natural increase. This method takes time, and time which may be money, but it is by far the safer and more satisfactory in its results, and it must be recognised as a higher grade of dairy farming.

A desirable combination, in starting, is to buy the number of cows desired, and good animals of the sort determined in advance. If one's means will permit, include a few superior cows, and a first-class bull at any rate. Let the cows selected be such as have had two calves, and perhaps three, so that they may be judged by their own development and yet be young enough to improve and be in full profit for some years. With a herd thus formed, begin at once the work of improvement by breeding and selection. Sell promptly any cow which proves unsatisfactory, and replace her by the best increase of the herd, or purchase occasionally an animal which will raise the average quality.

PURE BRED DAIRY CATTLE AND GRADES.

A dairyman can hardly be advised to buy at once a full stock of pure-bred cattle of any breed, if his sole object and dependence for profit is to be the dairy product of the herd. Such a venture will necessitate large investment, and should include the breeding of registered animals, for sale at remunerative prices, as a part of the business. Well-bred and well-selected grade cows, of the line of blood desired, seem to be the most profitable animals for the practical dairyman, or at least the best to begin with. If enterprising and progressive, the owner will hardly be content with grades only. He may begin with only his bull pure bred; presently he will want a registered cow to match, then one or two more. Thus he will be steadily and properly working toward a purely-bred herd. If the breed chosen is the right one for the object sought, it will soon be found that the more of this blood the herd contains the better. Starting with half-bred cows (the offspring of pure-bred bulls and dams of mixed or uncertain blood), the next grade, three-fourths pure, will prove

better dairy stock, if the bull is what he should be and the increase has been culled. Another step higher is better still, better for the dairy, and so the grading goes up and improvement goes on until the blood of the herd is practically pure. The best dairy results may thus be reached, but the herd has a taint. It lacks pedigree. Its increase, however excellent in dairy performance, must pass and sell as grades. The owner feels this, and is pretty sure to gradually replace his well-bred cows, almost pure-bred, with fully pedigreed and registered animals. This end is reached sooner and easier by starting with one or two registered females, and, of course, a registered bull. Moderate investment and the lessened risk of loss in the hands of one unaccustomed to handling registered stock, and finding a market for the surplus, doubtless favour grades for the dairy herd. The argument and the probabilities of success, based upon the fixed principles of breeding, are on the side of pure-bred, registered stock. In the hands of experienced men the latter prove the more profitable in actual practice.

In these days any dairyman who wants registered animals of any of the approved breeds can get them if he will but make the effort. The beginner in registered dairy stock cannot be too strongly urged to buy and breed on the basis of individual and family merit and dairy record, and not upon pedigree alone. Pedigree is of value and should be well studied; it is the best guaranty that the calves to come will make good cows. But the pedigree should be supported by uniform excellence in the family and by evidence of merit in the particular animals bought. Although the investment is greater, there is greater certainty of good results if mature cows are bought which show what can be expected of them, if they have not already made a record, than if calves or undeveloped heifers are selected. It is also economy, having chosen the right breed, to purchase good representatives of that breed, rather than be content with only average or even ordinary animals. Successful dairying has proved that the greater profit comes from the best cows, whatever their kind. This is as true of pure-bred or registered stock as of common cows. It is better to pay

300\$ for three excellent cows than to pay the same for four good cows or five which are only fair. A really superior dairy cow of a superior family, with pedigree which gives assurance of calves equal to the dam, if not better, is always worth a large price. Such an animal adds much to the average value of any dairy herd. In buying registered cattle, deal only with men of reputation as breeders and of strict integrity; "the best part of a pedigree is the name of the breeder."

THE BULL AND HIS TREATMENT.

With any dairyman who depends upon breeding and rearing calves for the maintenance of his herd and its improvement, the choice of a bull is a matter of prime importance. The bull is constantly referred to as "the head" of the herd, and that trite saying, "the bull is half the herd," should never be forgotten. Every calf added to the herd takes half its blood from the bull. Often this is the more important half. The bull is always the main dependence for raising the average quality of the herd, and should be chosen with this object in view. This is especially true if the cows are grades and "grading up" is in progress. The grade dam may be selected and largely relied upon to give size, form, constitution, and capacity of production to her heifer calf; its dairy quality, the inbred power to increase the richness of milk, is derived from the pure-bred sire. One cow may prove a poor dam, or fail to breed, and still give a profit in milk. Such a loss is comparatively trivial, and the fault easily corrected. But if the bull fails, or proves a poor sire, the entire increase of a year may be lost. In getting a bull, get the best. At least approach that standard as nearly as possible. Make a study of the animal's pedigree and the dairy history of his ancestors, and especially of the females among his nearest of kin. Then see that the good qualities of his progenitors appear to be reproduced in the animal in question. A common error among dairymen is to use immature bulls, and to dispose of good ones before their merit as sires has been fairly proven. Bull calves are cheap, and young bulls are considered much easier to handle. But it is good advice to the buyer to purchase a bull of some age, whose

progeny prove his value of a breeder, rather than a calf of exceptional pedigree; and to the owner, having a sire of proved excellence, to keep him and use him for years, or as long as he shows himself potent and prepotent. (Of course the question of too close inbreeding is not forgotten and must not be overlooked by the breeder.) The writer is a thorough believer in the use of mature bulls of known value as sires.

The chief objection made to bulls of some age is that they are likely to be vicious and dangerous. Everyone recognises the difference in temperament between the fleshy, beefy bull, and the one of pronounced dairy character; but experience and observation have taught that the bulls of marked dairy type are much alike in disposition, regardless of breed. In all the breeds (as among men) some bulls will be found of naturally bad temper, but it is believed that the great majority of bulls, of all the dairy breeds, can be safely kept until too old for service and handled without serious trouble, if only, properly reared and judiciously managed.

In rearing a bull accustom it to being handled from calfhood, but without fondling or encouraging frolic. Give it kind, quiet, firm, and unvarying treatment, and keep it always under subjection, that it may never know its strength and power. Insert the nose ring before it is a year old, keep this renewed so as to be always strong, and always lead and handle the animal with staff in the hands of a discreet and trusty man. The bull should never run loose in yard or pasture, but should be provided with abundant and regular exercise, always under restraint and full control. The "walk around" arrangement, like the sweep horse power, affords a fair degree of voluntary exercise, but is hardly sufficient. The best plan seems to be to provide a suitable tread power with a governor attached, place the bull in this daily, and let him walk a fixed time or a known distance. The main object should be regular and sufficient exercise for the bull. Incidentally, he may be made to run a fodder cutter or a cream separator and perform valuable service. As age and strength increase let the staff be supplemented by strap, chain, or rope, attached to a second

ring. To this may well be added some hitching or leading chain with a strong strap around horns or neck. Let there be always a double hitching device, so that the bull may never by accident find himself loose when he should be tied. If restiveness and temper are shown, add to the exercise, in duration or quantity, without violence; a bull physically tired may be depended upon to be quiet and easily managed.

It is much better to keep the bull as much as possible in the presence or in full sight of the herd than stabled by himself in a lonely place. Let him be in the same room with the cows during the stabling season, and at milking times the rest of the year.

INDIVIDUALITY AND CULLING THE HERD BY ITS RECORD.

As soon as the herd is established and in working order, the study of every individual animal should begin. To guide rational treatment and insure greatest profit, the owner must become familiar with the characteristics of every cow. Peculiarities of temperament, susceptibility to surroundings and varied conditions, and especially the dairy capacity of the animal, should be matters of observation, deliberation, and record, not merely of conjecture and memory. The record of the herd is a matter of utmost importance. The system of record should conform to the circumstances of the case and extent of the business. (It is desirable to reduce the labour of bookkeeping to a minimum, and yet accuracy and sufficiency of record must be secured. Fortunately, inexpensive forms can now be found for sale, which are based upon long experience, and in variety to suit different wants.) The record should include a concise history and description of every member of the herd, with a summary of the dairy performance. The latter requires a daily record of the milk yield of every cow, with notes explaining irregularities or occurrences of interest. If the quality of the milk is a matter of any importance, as it is in most cases, and ought to be, however the milk is disposed of, a fat test should be made of the milk of every cow for several consecutive milkings, as often as practicable. Some form of the Babcock tester is the simplest, and now within

the reach of every dairyman. According to the size of the apparatus, a certain number of milk samples can be tested at one time, and thus the record of a large herd can be completed in a few days. It is well to make this test and record of the quality of every cow's milk at least once a month. The most satisfactory practical record is the average percentage of fat found in the milk of several successive milkings, samples from which may be mixed and this "composite sample" tested, thus obtaining the average; the method is easily learned and practised. This record of quality, taken periodically, joined with a summary of the daily quantity of milk, gives a full dairy record of the cow, upon which her value can be readily computed. To give the owner a more complete knowledge of his operations, there should also be a record, of at least approximate accuracy, of the food of every cow, with monthly summaries of quantities or value, so that the economy of production may be shown.

Such records are far more easily made than the description may indicate, and are well worth all they cost. They form the only accurate and safe basis for judging of the individual merits of the different animals. The improvement of every herd, which should be the constant aim of its owner, depends upon periodical culling and getting rid of unworthy members. No one can afford to do this upon guesswork alone. One well authenticated example of the value of keeping such record follows: A dairyman of wide reputation, president of a State association for years, concluded to adopt the daily milk record, rather because of those who advocated it than from any conviction of needing it himself. His herd was of his own breeding; he had handled every cow from its birth, and he and his sons did the milking. Before beginning the record he made note of the joint opinion of himself and sons as to the half-dozen best cows in the herd, and an estimate of their season's milk yield. When the year's record was completed it was found that in order of actual merit the cows actually stood thus: First, his fifth; second, a cow not on his merit list; third, his fourth; fourth, his first; fifth, his sixth; sixth, like the second; and his second and third still lower on the list,

These facts were verified by subsequent records. Still more remarkable, this experienced owner proved literally "by the book" that about one-fourth of his cows were being kept at an actual loss, while others barely paid their way.

Good judges believe that in the entire country one-third of the cows kept for their milk do not pay for their cost of keeping, and nearly a third more fail to yield annual profit. As a matter of ordinary business prudence and a condition essential to the best results, every dairyman should study the individuality of his cows, keep a sufficient record of quantity and quality of milk product, know approximately the cost of production, and systematically weed out his herd. After proper consideration and practical tests as to possibilities, set a standard for a satisfactory cow and maintain this standard by promptly disposing of the animals which fail to attain it, unless reasonable excuse appears, with the prospect of better conduct in future, and gradually, but persistently raise the standard.

ACCOMMODATIONS FOR THE HERD.

The large and lofty barn, in which to keep the cattle and the crops, the manure and farm implements, all within four rectangular walls, and under one roof, can no longer be regarded as perfection. No matter how well arranged and how thorough the ventilation, the danger of loss and damage is too great. It is well to house all the forage, and a large storage building may be necessary. Economy of labour requires the forage to be easily placed before the cattle. The best modern practice calls for a separate or slightly attached building for the cows, with no manure cellar under them, and no large quantity of forage above them, and preferably none at all. The best provision for such manure as cannot be at once applied to the land is an open shed or covered yard. The cow house should be on the ground level, rather than in a basement, and be light, dry, and roomy. A room open to the roof, which is fairly high, is better than a low, level ceiling above the cows. The former may involve a little more work to keep free from dust and cobwebs, but it affords the air space needed for health and comfort. The

latter necessitates special arrangement for ventilation, and these, constructed on the best plans, often fail to work in practice. Sanitary authorities advise 600 cubic feet of space for every animal, but the best cow house the writer has seen allows double this quantity, and it appears none too much. Where the climate will permit, there is no better plan than to let cows stand upon the ground, the clay or earth being packed hard and raised somewhat above the level round the building; shallow gutters behind the cows, and a feeding floor in front of them. More durable floors, and quite expensive, are made of grouting and cement, or of brick on edge; but such are damp and cold, causing rheumatism and other ailments, unless covered with a false floor of wood, or provided with an unusual abundance of bedding. Box stalls are undoubtedly the ideal for cows as well as for horses; in a box 8 to 10 feet square a cow may be left untied, and if supplied with enough bedding she will keep clean and well, although the stall is not cleaned out for months at a time. But such boxes for a large herd require too much room. Every cow should have her own stall, however, wide enough for comfort of cow and milker, and well protected from the neighbours on either side; $3\frac{1}{2}$ feet width is little enough and 4 feet is better.

From the great variety of cattle ties one should be selected which combines, in greatest measure, freedom of movement, comfort, and cleanliness. There are serious objections to all stanchions; if some form of this device is insisted upon, let it be one which is so hung as to move a few inches in any direction. A desirable substitute for a stanchion is a wide strap or light chain around the neck, with a ring at the throat (this part to be always worn by the cow), and a snap, with a few links of chain, attached to an iron ring which moves freely upon a 3 or 4 inch post, fastened upright at the middle of the side of the feed box next to the cow. An excellent patented device consists of a flattened bow of metal or wood, shaped like a widely spread letter U, the ends hinged at the front corners of the feed box, the bow resting on the back edge of the box, and the neck strap fastened to this bow at its middle; this gives much freedom of movement and

causes the animal to move backward a little when it lies down, and forward when it rises. An open, level feeding floor in front of the cows seems to be better than any form of boxes; if boxes are used, they should be as large as possible, and yet have every part within reach of the cow as tied, and they should be so constructed as to be easily cleaned. A manure gutter behind the animals aids in cleanliness, but while it should have good width, 16 to 24 inches, it should not be too deep; if enough to hold the droppings of a night, that is sufficient. "Self-cleaning" stalls and gutters have not proved successful. The length of stall from fastening to gutter should suit the size of the cow; it is bad practice to have them so long as to induce filthy udders and legs, and also to have them so short that cows stand habitually with hind feet in the gutter. Arrangements should be convenient for removing the manure and for supplying absorbents for the urine, and a limited quantity of bedding. Liberal use of land plaster about the gutters and the floors over which the cattle pass is very desirable as a disinfectant and conservator of ammonia. Lime should be used with equal freedom, as whitewash on the walls of the cow house, but not on its floors.

The stable should be provided with windows to admit light and air abundantly, and arranged to let sunlight as nearly as possible into every portion of the apartment where the cows stand, during some hour of every clear day. Yet the windows should be shaded when desired, and they should be fixed to open partly without subjecting the cows to direct drafts of air.

The extremes in providing water for the cows are to be avoided. A long walk to get water, in all weather, is certainly objectionable. And all the devices for keeping water constantly before every cow, or supplying it at the stalls, at will, are open to serious objections. Some medium course is advised, and the best plan seems to be to provide one or more tanks in the yard, and one or more in the stable, at each of which but one cow should drink at a time. These should fill quickly after use, and freely overflow, that every cow may find the surface fresh and clear. The evidence is conclusive

that water for milking cows should not be too cold, and that it is profitable to bring water in severely cold weather to a temperature of about 50° F., if it can be cheaply done. Warming to blood heat has not been found advantageous.

Attached to the cow house should be an exercise yard for the daily use of cows during the stabling season. Roomy open sheds should form a part of this inclosure, and the whole may be well roofed over, if arranged for the free circulation of air and for admitting sunshine to a large share of it, while excluding wind and storm.

HEALTH OF THE HERD.

There is no point of greater importance in selecting animals for the foundation of a herd, or in making purchases of additions, than to get perfectly healthy stock. Animals chosen should be critically examined by a veterinarian if convenient, and should afford evidence of being strong in constitution and of healthful vigour. Besides the robust character of the individuals, the breeding stock from which they are descended, and the herd, stables, and farm from which they come, should be closely examined, on the score of health. Breeding and rearing the animals needed to replenish and increase the herd, and refusing to allow strange animals on the farm, are the best safeguards against the introduction of disease. If purchases must be made, let the new stock be strictly quarantined for at least one month before mingling with the herd. On every farm of any size a well-secluded building for a stock quarantine and hospital, suitably arranged and equipped, is a most useful adjunct. This is not needed for calving cows, or for cases of lameness or ordinary accident, but for cases of acute sickness, retention of afterbirth, abortion, or any symptoms of contagious disease, it is essential. Of course, the building itself, its care, and the attendance upon its occupants must be subjected to regulations suited to any hospital or quarantine.

There are many of the ordinary accidents and ailments to which domestic animals are subject which can be managed by an intelligent owner, or under his direction, without professional assistance. "Every man his own cattle doctor" is a

very delusive title; one may well follow this suggestion within reasonable limits, but there is always a point, hard to define, at which professional aid should be promptly summoned. So long as an owner is certain as to the difficulty, and has knowledge and experience as to treatment or remedy, he may depend upon home resources. But in a case of obscurity, uncertainty, or complications, the owner of a good cow disregards his own interests and his moral obligations if he fails to summon a veterinarian, as much as if he neglected to secure proper medical service for a sick child. And the veterinarian should be selected with the same care one exercises in choosing a family physician.

Close confinement, with impure air and lack of exercise, is as prejudicial to the health of milch cows as to that of human beings. Some recently promulgated theories of dark, warm stables and no exercise for profitable milk production are without rational basis and certain to lead to disastrous results sooner or later. Exposure to storms and cold is equally injurious to the health and profit of cows. A judicious mean is the provision for moderate exercise in the open air and sunshine, and the application of the same common-sense care for the comfort of cows which one would approve for members of his own household.

Every member of the herd, young or old, should pass under the critical eye of the owner or his trusty assistant daily, and preferably twice a day. The least symptoms of disorder, like dullness, loss of appetite, rough coat, and irregularity of milk, manure, or urine, should be noted and promptly receive the attention which it deserves. Experience is needed on the part of the caretaker to detect and correct the beginnings of trouble, and thus maintain the general health of the herd.

FALL-FRESH COWS MOST PROFITABLE.

Much has been written upon the best season for cows to drop their calves. Opinions still differ, and by far the greater number of milch cows are allowed to follow the most natural course, and either by indifference or intention they "come in" in the spring. The producer

of milk for sale, if he has an even trade, may want to have about an equal number of fresh cows every month in the year. If the bull is kept up and service controlled, this can be regulated as a rule, although unpleasant irregularities in breeding will sometimes occur and stubbornly resist correction. But if the prime object is to produce the greatest quantity of milk of the best quality and at the greatest profit from any given number of cows within a year, the evidence is overwhelming that the cows should be managed so as to calve in the autumn months. For like reasons, September is the best month in most parts of the country for a heifer to drop her first calf in order to best develop as a cow, and this almost regardless of the age of the animal at first calving. Calves born in the fall are easier reared and make better cows than those born in the spring or summer. It seems needless to rehearse the stock arguments on this subject, based upon the long experience of successful dairymen, but a brief recapitulation may be useful. The cow or heifer calving in the fall needs the most healthy and nutritious pasturage just following the strain and while coming into full flow. Just at the time when some falling off is likely to occur, the animal is brought to the stable and receives good care; the winter feeding and the returns from it may be depended upon to exceed the midsummer results for any like period. At the stage of milking and of gestation, when another dropping off in the milk yield may be looked for, the fresh pasturage induces a fresh flow, lengthens the milking season, and increases the year's total product. December and January are good months in which to control and supervise the service of the bull. Mid-summer and the dogdays are a good time for the cow to be dry and preparing to calve again, and a most unprofitable and annoying time to make milk or handle it. The greatest product and the richest comes at the season when milk and butter are always comparatively high in price. In actual practice four fall-fresh cows have been found to equal five which calved in the spring, in twelve months' product, and at about four-fifths the cost.

DRYING OFF COWS AND CALVING TIME.

It is not unusual to find a cow which shows no inclination to dry off at any time after dropping her first or second calf. Such an animal shows an excellent dairy trait—persistence in the milking habit—but it is doubtful if continuous milking is profitable. Better results are believed to be obtained from cows which are inclined to take an annual rest, if not too long. A month is long enough; three weeks will do in most cases, and six weeks should be the longest time encouraged or allowed for a cow to be dry before calving. An accurate record of service by the bull is essential to preparations for drying off cows at the right time. A table should be kept of the dates when cows of the herd are successively due to calve, with notes as to the milking habits of every one. When the time comes for drying off a cow the grain food should be gradually withdrawn. This may of itself cause milk to cease forming. If not, omit one milking a day, then milk but once in two days, and thus extend the drying period over two weeks. The udder must be watched, and if any hardening or unnatural heat is shown regular milking must be resumed. If a cow continues to secrete milk it must be drawn. No cow should be forced to “go dry” against manifestly natural resistance to so doing. On the other hand, if

an unpleasantly pungent or “smoky” taste appears in a cow’s milk she may as well be dried at once, regardless of dates, as her milk will not be good until she is fresh again. The dry cow may be kept on pasture alone, not too luxuriant, or on a low stable diet, mainly of coarse forage, until about two weeks before calving. Yet the ration, while comparatively “wide,” should be nutritious, and it should include a share of succulent food—roots or silage. Then a slow but steady increase of feeding may proceed, of a nourishing, cool, and laxative kind, so as to become narrower in ratio. Wheat bran is a good material to use at this time, but new-process linseed meal is better. Experience has led the writer to endeavour to have his cows calve on an upgrade, as it were, while daily gaining in strength and vigor, on a judiciously prepared, nourishing diet, but without high feeding or plethora. A week before calving remove the cow to a roomy, comfortable, quiet box stall, preferably within hearing of the herd, if not in sight. Be sure the bowels are quite loose and moving freely for two days before calving. Watch for the event, but do not disturb the cow or interfere unless something goes wrong or assistance is manifestly necessary.

(To be continued.)

Death of Mosquitoes.

MR. HENRY CLAY WEEKS, writing in the *Century*, gives an interesting account of the first attempt made by the Americans to exterminate mosquitoes on a large scale. The attempt is being made over a territory fifteen miles long and five miles wide, and was decided upon as the result of a successful experiment made in Center Island, Long Island, last year. Owing to the great rains and great heat, 1901 was pre-eminently a mosquito year, but the experiment was a great success. The object of the attack was the water in which the mosquitoes breed. Marshes and pools had to be drained, and water-barrels done away with. As in the larval

breathing, it was found that if a thin film of oil was placed on their breeding places destruction would result. The thin film of oil is effective irrespective of the depth of the pond. Petroliers were employed, and it was found that where they worked carefully not a single insect got to wing. Of the few that escaped it was found that near them some water surface had been overlooked. To drive along the borders of the marshy land operated upon was formerly a danger to man and beast, but Mr. Weeks, who walked over it during and after the work, says that he did not see a single mosquito. Center Island was practically entirely relieved from mosquitoes as the result of one season’s work.

Gleanings.

Sheep and mutton imports indicate that the English trade is gradually becoming a dead meat trade. There were fewer live sheep imported during the three quarters of the year than last year. The reduction amounts to 22.00 per cent.

Cases of curious captures during harvest are numerous. A dog said to have lost his leg, was passed over the canvas, and bound up in a sheaf, discharged from the reaper, and is now going about—minus his leg, it is true, but otherwise none the worse for his experience.

Mrs. Lee, in her "Anecdotes," gives an instance of the intelligence of the goat which points to higher wisdom than this animal usually gets credit for. She and her servants had been in the habit of feeding a she goat and her kids which frequented the square in which Mrs. Lee lived; the goat, when she wanted food, would come and thump with her horns on the front door, the kids following their mother's example. "After a time this remained unheeded, and to our great astonishment one day, the area bell used by the tradesmen, the wire of which passed by the side of one of the railings, was sounded. The cook answered it, but no one was there save the goat and kids with their heads bent down towards the kitchen window. It was thought that some boy had rung the bell for them, but the goats were watched, and the old one was seen to hook one of her horns into the wire and pull it."

The French authority Estienne gives the following directions to the shepherd in the "*Maison Rustique, or Countrey Farme*," about 1616: "The shepherd shall order and govern with great gentleness . . . must rather be and show himself the leader and guide of his beasts than lord. Guiding them to the field, he must alwaies go before them to hinder and keep them back from running into fields where they might feed upon evil and hurtful grass. . . . He shall rather keep a white dog than one of any other colour to follow his sheep, and he himself must be also apparelled in white, because that sheep are so naturally inclined to fear as that, and if they see but a beast of any other colour they doubt presently it is the Wolfe which cometh to devour them. This dog must have a collar of iron about his neck, beset with good sharp points of nails, to the end that he may more cheerfully fight with the Wolfe, perceiving himself thereby to have the advantage, as also that the Wolfe may not take occasion to hang him in his own collar."

If a cocoa-nut were planted in the ground in an upright position, its growth would be retarded, because although the roots force a passage between the husk and the shell, coming out at a point of the shell which has been cut off to allow them exit, yet the hard shell would remain immediately under the stem until the former had decayed. Whereas if the nut is planted in the natural position in which it falls, namely, on the side, the roots come out, from the first, clear of the husk and shell.

On 13th November, 1798, a ploughing match came off in Windsor Great Park between oxen belonging to King George III. and those of Lord Somerville, which had been brought from Somersetshire for the purpose. Half an acre of ground having been measured, Lord Somerville's team (four in the plough) started first, and ploughed the half acre in an hour and twenty minutes. The plough cut two furrows at a time. The King's oxen were then yoked to the plough, but, though the Royal team consisted of six, they lost the match by forty minutes. Lord Somerville's were evidently carefully selected and trained cattle, for after the match they were sent off home to plough another match against time. Lord Somerville was at the head of the Agricultural Department of the time.

Mr. T. F. Dale, in his new book on "Riding and Polo Ponies," describes the method of buying horses for the native cavalry regiments in India. "It was the custom for each irregular regiment to buy its own horses out of the regimental fund. In theory every trooper brought his own horse with him when he joined; in practice most men contributed either a lump sum or so much a month from their pay to the fund, to which in addition was paid certain Government contributions and compensations for loss or injury on service. If the fund were rich and well managed, the regiment could and did give larger prices for its horses than the poorer ones. The custom was for an English officer, selected for his knowledge of horses and sound judgment, to visit the fairs. He took with him a native officer, or non-commissioned officer, and a party of troopers, and pitched his camp near the fair ground. There was tremendous rivalry between the different regiments as to which should secure the best horses. Many purchasing officers used at one time to picket the roads leading to the fair, so as to intercept the best horses before they reached the ground, and many had bought half their quota of horses before the fair was opened."



Photo by Editor

Japanese Plum Tree.

THE above represents a plum tree of the Japanese variety at Mr. Harwin Pepworth's property, Faugh-a-Ballagh, near Maritzburg. The promise of fruit,

it will be seen, was great. The promise, however, was not fulfilled, and Mr. Pepworth has abandoned the variety.

Pine Apples, Cultivation.

THE following is an address delivered before teachers of elementary schools, Kingston, Jamaica, by Mr. Chas. E. Smith :—

SOIL.

The pineapple is a decidedly exacting member of the vegetable kingdom, insisting upon having its wishes and needs respected and provided for, making no

allowance whatever for our good intentions, and well illustrating what Miss Greenwood calls "the cussedness of inanimate objects." The soil is of first and most vital importance. The pineapple will grow upon soil too poor for other products, but this soil must be light, loose and thoroughly drained. I quote a partial analysis of a typical pineapple soil in South Florida :—

	Per cent.
Insoluble Residue	97.5085
Humus . . . . .	.24
Nitrogen . . . . .	.0378
Total Phosphoric Acid . .	.0336
Total Potash . . . . .	.0086
Total Lime . . . . .	.2100

What proportion of the phosphoric acid and potash given above is available is not stated.

In comparison I also give the analysis of the soils at Barbican and Billy Dun, St. Andrew, as recently furnished by the Island Chemist:—

BARBICAN.

	Per cent.
Insoluble Residue	77.40
Humus	1.765
Nitrogen . . . . .	.1190
Total Phosphoric Acid . .	.0973
Available Phosphoric Acid	.0402
Total Potash . . . . .	.9887
Available Potash . . . . .	.0134
Total Lime . . . . .	.7672

BILLY DUN.

	Per cent.
Insoluble Residue	80.71
Humus	1.32
Nitrogen . . . . .	.0770
Total Phosphoric Acid . .	.0973
Available Phosphoric Acid	.0411
Total Potash . . . . .	.0274
Available Potash . . . . .	.0084
Total Lime . . . . .	.6606

The soils of Florida are so barren that the cane or banana planter of Jamaica would pass them by in contempt, yet these soils are made productive and profitable by intelligent use of green manures and commercial fertilizers, as well as by scientific and up-to-date methods of cultivation. Barren as they are, they give in mechanical condition just what the pineapple desires. Stiff, hard, lumpy soils are absolutely unsuitable. If you will strip the lower leaves from a pine sucker you will note that the rootlets are already pressed close to the but. If when planted these rootlets encounter soil, or lumps of soil difficult to penetrate, they continue this winding instead of spreading freely through the earth, result-

ing in what is known as "tangle root" and the consequent death or stunting of the plant.

I have heard the argument used that whereas the pinguin is allied to the pineapple, therefore any soil upon which the pinguin thrives is suitable for pineapple growing. This is very superficial logic, however, for it is also true that the Tillandsias and Bromelias are related to the pine, yet I do not think that anyone has advocated setting pineapple plants in the branches of the forest trees. Choose the lightest, sandiest soil you can find. Fertility is of secondary importance.

PREPARATION OF THE LAND.

Very few soils exist in Jamaica naturally light enough to give the ideal conditions desirable for the pineapple. We must therefore prepare the land we have selected with the utmost care, being thankful that this increased expense is fully offset by the greater fertility we enjoy here. The land must be thoroughly cleaned of all trees and roots and the soil well worked with plough or fork until it is as fine as the seed bed of the market gardener. Drainage is of as great importance as the soil itself, no plant being more intolerant of excessive moisture. In St. Thomas-ye-Vale I find it necessary to run ditches as close as twenty feet apart. In St. Andrew forty feet apart will answer—the ditches being two feet wide and eighteen inches deep. The land between the ditches is divided into beds 10 to 12 feet wide with a four feet path separating the beds. The land should be carefully marked out for planting, and it is well to continually bear in mind the fact that we are to engage in *intensive* cultivation.

PROPAGATION.

The pineapple is propagated by suckers, ratoons, slips, crowns, and seeds. The word "sucker" is used so indiscriminately in Jamaica, often referring indeed to young orange seedlings, tomato plants, etc., that I may be pardoned for defining these terms:—

The true suckers are the offshoots growing out from among the leaves of the parent plant. They are the best, and in

a properly managed plantation, the only offshoots available for propagation.

Ratoons are also suckers, but are designated as ratoons when thrown out from underground. After the fruit is cut the ratoon is the offshoot allowed to remain to bear the following year as it is more firmly attached to the stock than the higher suckers, and has in addition roots of its own. When two ratoons are thrown out one should be removed and planted.

Slips are the offshoots found at the base of the fruit in most varieties. Save that they are slower of growth, they answer as well as suckers for propagating, but, as I have remarked, in a properly managed plantation they are not available, as they should be broken off as soon as formed, so that all the strength of the plant may go into the fruit. The smooth Cayenne has no slips, only suckers, and this is one of several reasons which accounts for the high price for this variety.

The crown is the tuft of leaves on top of the fruit. Crowns will make plants, but are of slow growth, and, save when a fruit has been spoilt by rats or sunburn, they are naturally not available for planting, the crown being an attractive feature to the purchaser.

Seeds are rarely found. I notice they are more common in Jamaica pines than in those from Florida. They are only used after hybridizing for the purpose of producing new varieties.

PLANTING.

The land being properly prepared and the suckers secured—by the way, they should be 12 or 18 inches long and selected from healthy plants which have borne or are bearing fruit—we are ready for planting. Opinions differ as to the best distance, there being arguments in favour of both wide and close setting. Four years ago I commenced planting at the usual Florida distance, 22 x 22 inches, then 24 x 24, 24 x 30, 3 x 3 feet, and even 3 x 4 feet. I have gradually been working back to shorter distances, and have just set 2,400 at 18 x 24 inches. I believe 2 x 2 feet may be considered safe, though much depends upon the location and variety. In St. Thomas-ye-Vale,

where the sky is clouded a great part of the time and there is a heavy rainfall, wide planting seems desirable, but in St. Andrew I prefer close planting, so that the ground may become quickly shaded to prevent scalding of the roots. Care should be taken to have the plants set in true lines each way. Many methods of accomplishing this will suggest themselves. My own way is to run a base line the width of the field at right angles to the beds; I then stretch a line along each side of the bed to be planted, staking off these lines at the distance I wish to set the suckers in the long rows. I use a strip of 1 x 3 board with notches showing where each plant should be set across the bed, and move this strip from stake to stake, planting the suckers with a small hand trowel.

The handle of the trowel may be used for pressing the earth firmly about the base of the plant. The only preparation of the sucker is to strip off the lower leaves, and cut the broken end clean that it may callous readily.

CULTIVATION.

The cultivation consists in keeping the plants clean all the time. Remember that the pineapple is an aristocrat which will sulk if required to share its surroundings with more plebeian plants. In Florida, where the soil is practically barren of plant food, artificial manuring is necessary, and in the covered pineries about Orlando as much as three tons of highly concentrated fertilizers per acre are used. Again, the pineapple shows its patrician tastes in that it is decidedly capricious as to its food. Such organic manures as cotton seed meal and castor pomace invariably give poor carrying fruit, though dried blood does not seem to be objectionable as a test of 193 plots treated with different fertilizing ingredients and combinations of ingredients carried on by the Florida Agricultural Experiment Station resulted in favour of Blood, Bone, and Potash. It is also strange that though superphosphates made of bone treated with sulphuric acid are not injurious, yet when the base is of rock phosphate (marine bone deposits) this is generally regarded as poisonous to

the pine. I may remark, however, that I have never received any return from the money I have expended for phosphoric acid for this fruit. Up to the present time, Jamaica soils do not seem to require artificial fertilizers, while in some cases their use seems to have resulted in actual disaster. It stands to reason, however, that our soils cannot yield 10 to 20 tons of fruit year after year without this drain needing to be made good in time, and I am much interested in a series of experiments now being conducted by the Island Chemist, which may also show some effect in the carrying qualities of our fruit.

GATHERING AND PACKING.

What a sense of satisfaction the grower feels as, after months of anxiety and labour, his fruit approaches maturity and he begins to think that his woefully one-sided ledger account may begin to show a better balanced appearance! Yet beware the experience of the glass vendor in "Arabian Nights" whose day dreams had made him Grand Vizier about to marry the Princess when a slip of the foot brought his great visions and fragile wares in ruin to the pavement! "Eternal vigilance" is the price of satisfactory pineapple sales, and all your hopes may be dashed even now by careless or improper methods. The woeful inefficiency, indifference and lack of loyalty on the part of the Jamaica labourer makes the unceasing personal attention of the employer absolutely necessary while the fruit is being gathered and packed for shipment. It is impossible for me to explain, save in the field just when a pine is fit for picking. It varies, indeed, with the season of the year and the distance it is expected to carry. One point is vital—the fruit *must* have attained its full size. A pine not properly matured will decay before it ripens, or if it ripens it will be a poor apology in flavour for this luscious fruit. An inch or more of the stem should be left attached to the fruit by which it is hung up to dry for twenty-four hours or more, when it is ready for packing. A number of styles of pineapple crates are used, the important thing being that they should give good ventilation.

Until recently I have used the "Orlando Pineapple Crate," 12 x 20 x 22 inches, holding two layers of 8 to 14 Smooth Cayenne or 16 to 20 Ripleys. Later experience, however, has assured me that a single-layer crate is more desirable, as the fruit seems to carry better. The buyer also prefers it, as it enables him to inspect all the fruit at a glance.

Pines should always be wrapped in something to protect them from bruising. Some use common Manila paper, but this hardly gives the desired protection. I use "Excelsior" made of fine wood shavings. Clean dry hay or straw will answer. Banana trash well dried is also used. In the Azores, corn husks stripped fine with a rasp like a large curry comb is the common packing material. Pines should be packed firmly that they may not fall about, but should not be jammed into the box. In packing, the first pine is placed with the but towards the packer in the lower left hand corner of the box, the second against it, the but at the upper side of the box, the crowns overlapping and so on, the buts and crowns alternating. If the box contains two layers, the first pine of the second layer goes in the *upper* left hand corner, the but coming over the crown of the fruit below it. The two layers will be just reversed, similar to the method of "breaking joints," as it is called in orange packing. Stencil the wood "Top" on both top and bottom sides of the crate that when opened the fruit may be seen in layers just as packed. As far as possible the crowns should be protected from bruising, as they add greatly to the appearance and selling value. Exercise every care to make the package neat and attractive, for with fruit as with people—"first impressions go a long way."

INSECTS AND DISEASES.

While the pineapple requires, and repays constant attention and care, yet when compared with many other plants it cannot be said that it suffers severely from insects or diseases.

The only insects which seem to affect it are mealie bugs, red spider, and scale. The praedial thief of course comes under the head of reptiles. The red spider and

scale are rarely serious. The mealie bug may become so if neglected, and will cause serious stunting of the plant and fruit. Infesting as it does the white portion of the leaves about the body of the plant the use of sprays is practically unavailing. Much good is done by dipping the base of the sucker in a decoction of tobacco stems, 1 pound of tobacco to 2 gallons of water, before planting, but the only sure treatment is by fumigating with hydro-cyanic acid gas as recently described in a Bulletin issued by the Jamaica Botanical Department. "An ounce of prevention is worth a pound of cure."

The diseases or maladies of the pine are "blight," "sanding," "pike," and "tangle-root."

"Blight" is a very serious trouble generally ascribed to a fungus. An acquaintance who was visiting Jamaica last winter, and who is interested in scientific research in an amateur way, kindly devoted much time to a study of this disease, making careful microscopic studies and cultural tests which demonstrated very clearly that healthy leaves can be inoculated through the spores of diseased plants. In practice we have reason to believe that a diseased stock will prove a centre of infection for surrounding plants. The best course to pursue is to dig up the plant and burn it immediately, saturating the soil where it stood with a strong solution of copperas. A plant, if taken up and the butt trimmed back to healthy tissues when the wilting is first discovered, may sometimes be saved, but on the whole I think it is wiser to be rid of it at once. Fortunately the disease does not spread rapidly, and may easily be checked by the observant cultivator if taken in time.

"Sanding" is not so common in Jamaica as in Florida, where the soil is lighter and easily blown into the heart of the plants. Ants cause much trouble here, however, by carrying earth into the leaves, but this is an effect, not a cause, and is due to the presence of the mealie bugs which the ants try to protect, being fond of the sweetish secretion with which they cover the leaves.

I am but little acquainted with "Spike," but have regarded it as due to careless selection or non-selection of suckers rather than a disease. Prof. Rolfs, the Biologist of the Florida Agricultural Experiment Station, seems to consider it as caused by improper or ill balanced fertilizing.

I have already referred to "Tangle-root." Authorities differ as to its nature, but I think that in a majority of cases it is simply due to poor preparation of the land, the roots being unable to freely enter the earth and so winding about the butt cause strangulation as the stock expands.

VARIETIES.

I presume that to a majority of people in northern countries a pineapple is a pineapple, just as to the average Jamaican a peach is a peach, yet the different varieties vary greatly in quality, appearance and merits. I think on the whole we should be thankful that propagators have not been too ambitious in rolling up a long list of names as has been the case with oranges. The Florida Horticultural Society tabulates a list of 73 different varieties of oranges, and that without synonyms. Counting the synonyms which same enterprising nursery men in Florida insist upon considering distinct varieties, the list swells to something like 110. I am a rather old orange grower, but I doubt if I could identify more than 14 of these, and to do so should have to include four of the *Citrus nobilis* class. Of course there are many others highly desirable, but I think that the average practical orange grower will make his grove of but seven or eight standard kinds. The same authority (and none is higher) enumerates 18 varieties of pines as follows:—

- | | |
|-------------------------|---------------------|
| 1 Abbaka. | 10 Ripley Queen. |
| 2 Antigua, Black. | 11 Lord Carrington. |
| 3 Antigua, White. | 12 Prince Albert. |
| 4 Black Jamaica. | 13 Porto Rico. |
| 5 Black Prince. | 14 Pernambuco. |
| 6 Blood | 15 Red Spanish. |
| 7 Crown Prince | 16 Smooth Cayenne. |
| 8 Charlotte Rothschild. | 17 Sugar Loaf. |
| 9 Egyptian Queen. | 18 Enville. |

It is possible that some of the above may be the same under different names. On the other hand there are some varieties not included, for example, the Trinidad, of the English hot houses, is not mentioned. Possibly the compilers considered it identical with the Porto Rico, an error, I think, though it may be a seedling or selection of that variety, nor does the list include a sub-variety of the Smooth Cayenne — the "Variegated Smooth Cayenne," bearing the same fruit but noticeable chiefly for its beautiful variegated leaves of green, white, and red stripes. But one Ripley is mentioned, whereas in Jamaica we know that the Red and the Green Ripleys are very distinct. Still I mention in this connection the curious fact that a Green Ripley plant often throws out a red sucker, or bears a fruit having a red crown and *vice versa*.

There are several varieties in the above list with which I am not acquainted. Probably some of these are known only in hot houses and have not been successful for open air cultivation. You are probably as familiar with the Jamaican sorts as I am, perhaps more so, as my cultivation consists mostly of Smooth Cayennes and Ripleys.

The Red Spanish I think is identical with our Bull-Head, though I know many will differ with me. Certain it is that I have often shipped Bull-Heads under the name of "Jamaica Pines," and my agents in New York have reported "your Red Spanish have sold for etc., etc." The Black Jamaica is desirable because of its size. It is also a very fair shipper. The "Sam Clark" (which, of course, is not included in the list I have quoted, and which, I believe, is not known outside of Jamaica), has always been an interesting native variety to me, as I believe it has considerable possibilities. It is of a good shape, packing out nicely, and has a most showy and attractive crown. To a cultivated taste its flavour is inferior, and its acid distinctly "raw." If this can be modified by some generations of cultivation, the variety will prove an acquisition. The Sugar Loaf, as largely grown in Cuba as here, is so badly affected with "black heart" as to be of little value for shipping. While I believe there is a great

field in the selection of our native pines, yet, speaking from a purely commercial point of view, and considering the rapidity with which the planting of this fruit is being extended in other countries, I can but feel that the time must come in the near future when only the choicer varieties can find a market. The Porto Rico was at one time very popular for open air cultivation in Florida, especially along the East Coast, because of its large size. I had one in Bog Walk, in this Island, weighing 14½ lbs. Its size, however, is its one and only merit. It is a shy bearer, requires double the room of other sorts, and in quality is no better than our Bull-Head or Black Jamaica. I do not think it is being planted largely now, better kinds having succeeded it.

The Abbaka somewhat resembles a very large red Ripley, though more conical at the base. It is much above the average size of pines and is of delicious flavour — none finer for home use. In dry weather it ships very well (though this is equally true of nearly all sorts), but during the rains it is extremely uncertain. Probably no other pine is so productive of slips.

The Charlotte Rothschild is a well rounded pine of quality resembling the Smooth Cayenne, its green crown prettily fringed with fine reddish spines.

The Enville or Enville City is a medium size, excellent quality, and distinguished by having a mass of little crownlets instead of single crown at the top. I have shipped so few of the Rothschild and Enville that I am unable to express an opinion as to their carrying qualities.

The Golden Queen is excellent in quality and for home use. A poor shipper, however, and, like the Sugar Loaf, very subject to "Black Heart."

The Egyptian Queen was at one time the favourite "fancy" pine in Florida. It was originally the Cleopatra, its present and better known name evidently the result of a rather shaky knowledge of Egyptian history. It no longer holds its high place in the esteem of planters which it once occupied. It is in every way inferior to our Ripley.

The Smooth Cayenne, everything considered, is to my mind the pine *par*

excellence. Its large size, perfect form, excellent flavour, and beautiful appearance make it the king of pines. It originated, I believe, in the English Hot Houses, later was grown in the Azores under glass, but without heat, then carried to Florida, where it is the most profitable variety grown under shelter, and is now being successfully cultivated in Jamaica. I must say I have seen specimens here equal in every way to any I have seen elsewhere. It is specially valuable for the English markets, where size and beauty of appearance count for even more than flavour.

I should be "carrying coals to Newcastle" to describe our famous Ripley before a Jamaican audience. Strange to say it was a failure in Florida—for what reason I do not know—and I hardly recognised it when I came here. In the quality which pleases the palate I considered it ranks above the Cayenne.

Surely nothing can be finer than our St. Andrew Ripley. It is also a good shipper. I have sent it to all parts of England and have had excellent reports as to its condition on arrival. I rank it with the smooth Cayenne as the first among pines. Its one regrettable feature is its small crown. Its warmest admirers have to admit this one weak point. Could we but get the size, form, and crown of the Cayenne, combined with the flavour of the Ripley, we should have the ideal, the perfect pine; and in this connection I must express the deep interest I feel in the experiments in crossing these two varieties now being carried on at Hope. Seeds have been obtained from this cross, and the young seedlings were thriving when I last saw them. I sincerely trust that the hopes and expectations of the gentlemen who have devoted so much time and labour to this work may be amply rewarded in the results.

Through the Water.

DR. THEILER, Government Bacteriologist, Transvaal, contributes to the *Transvaal Agricultural Journal* the following article on what he calls "Through the Water." The more common English expression we imagine to be "Over his Water." :—

"Through the Water" is certainly not a scientific name, nor is the disease of a specified kind, but the expression is familiar to every South African horseman. According to the writer's experience several diseases are included in this collective name, and could be brought under different headings or titles.

The symptom from which the ailment principally derives its name is the peculiarity that an animal during its work under saddle or in harness suddenly exhibits a desire to pass urine without being able to do so. The most common diseases usually attributed to kindred causes are explained hereafter.

Every experienced South African traveller gives vigilant attention first to

the proper feeding of his horse, and next to the regular passage of its urine. Europeans are comparatively neglectful of the latter point, although they may have had experience with horses, and the explanation is that no opportunity has been afforded of observing the peculiarity under notice. The reason is that in Europe horses make shorter journeys between resting and feeding places, the wayside inn being more frequent. In this country of long distances the animals have usually to make long runs before they can be outspanned. It is on this account that the complaint is so common. When a horse shows symptoms of inability to urinate, the cause is due to the fact that the urine has been retained too long. The trouble only happens with male animals; the mares, owing to the short urethra, being able to urinate whilst moving. The complaint cannot be called a disease. It is more a transient trouble, consisting of temporary paralysis of the bladder due to overfilling. The horses

usually show symptoms before the worst happens, e.g., the bursting of the bladder would be a sure sign of a fatal end.

SYMPTOMS.

The trouble usually occurs in working horses. In the first instance, it is observable that the animal becomes slow and awkward in his gait. He pulls back, halts, and tries to stale, but through being driven on by the whip or the mate-horse, he is unable to do so. Then the animal will begin to take shorter steps with his hind legs. He perspires, and appears to feel generally uneasy. This circumstance suggests a halt or an out-span. Now it may be observed that the animal shows symptoms of slight colic, that it makes several efforts to stale, which are at first unsuccessful until, after some time and rest, it is able to pass the water, and is then usually better. Death is seldom the outcome of this trouble, and then only when paralysis of the bladder has led to its bursting. The overfilling of the bladder can be ascertained by gently passing the hand through the anus, where the bladder will be felt lying under the hand like a tightly blown-out rubber ball. This can be easily done anywhere, and no particular training is requisite. It should never be omitted when the diagnosis is not certain.

Another disease, the diagnosis of which has hitherto placed it in the "Through the Water" category, is the hemoglobinuria of the horse. It is noticed after a horse has been inspanned and started its work, and it usually occurs when an animal has been purposely and specially well tended and stabled so as to fit it for a contemplated long journey. After the animal has proceeded some time on its journey, it begins to get stiff on the hindquarters, lingers often, and perspires more than usual. It drags its legs over the ground, and finally drops covered with perspiration. The respiration is very much accelerated. The horse cannot rise; if it does struggle to its feet it appears to be paralysed in the hindquarters. Of course, the malady may vary much in intensity; simple cases only showing stiffness, lingering, and lameness. In more

dangerous cases the animal passes no water, and, rightly or wrongly, the disease is attributed to this circumstance. More careful attention shows, however, that when the urine is passed by a horse suffering from this malady it is usually of a red colour. In the eye of a layman this proves the diagnosis: "Through the Water." The red urine, however, indicates that the disease is different to the malady first described, and that the cause is different also. The former complaint is due to over-driving; the latter, however, is an affection of the muscles of the hindquarters. It is generally said to be due to a cold in these parts; the idea being derived from the fact that the disease is almost exclusively confined to stable-kept horses, or to such animals as have not been at work or been properly trained. The disease may be of very short duration. A few hours after the appearance of the first symptoms, the animal may be well again, but usually the disease lasts from one to four days. Sometimes the horse does not completely recover, and a second attack may be caused by the first—the horse becoming quite unable to rise, and death occurs.

The third trouble ensuing from driving or riding is characterised by the fact that the animal becomes stiff, and finally unable to move its legs. It may have been excessive driving that caused the attack, but the individual disposition of the animal conduced to the trouble or was the entire cause of it, or, in other words, the animal was not fit for the work it had to do. The disease is easily confounded with laminitis, commonly called "foundered," but which is really not the same complaint, but an inflammation of the feet. I have often been told, when called to attend such cases, that the horse had not been observed to stale for some hours. But, on examining the bladder through the anus, I never found it full. I presume that this ailment is thought to be "Through the Water," because it is observed under similar conditions to the two already described.

The fourth derangement observed in working animals is the heat-wave. In this complaint an animal usually begins

with what in this country is called "flauw" (done up). Although horses which have a disposition to become "flauw" very often end with the symptoms of heat-wave, the two disorders are quite distinct, and must not be mixed up. An animal may become flauw through a good many causes, some of which have been described under "Diarrhoea," but the most common cause is the horse's bad condition, lack of proper food, or deficient training for the work it is intended to do. The heat-wave, however, may be observed in horses in the best condition. It shows itself in a severe lung trouble, and in the horsesickness season it is usually mistaken for horsesickness. The symptoms of lung congestion are preceded by heavy perspiration, followed by a lingering walk and quivering of the muscles (the animal finally dropping to the ground), and contractions of the legs and fits denoting the end. Many other diseases or ailments are included under the heading of this paper, such, for instance, as colic, the symptoms of which at the outset are very often identical with those of "Through the Water," but the maladies above detailed are most common.

TREATMENT.

Effective measures for prevention are obviously feasible. Experience in this country has among careful horsemen originated certain rules for the proper care of horses on a journey, based on intelligent observation and sound judgment, and their efficiency is proved by results. As already mentioned under the headings of "colic" and "diarrhoea," proper feeding is essential for the success of a journey. Next but equally essential is the rule that the working horse be given adequate time for rest at due intervals for the recuperation of its strength. The intelligent Boer methods in this respect are worthy of adoption. They do not work an animal under the saddle or in harness more than two hours at a stretch. A halt is then made under any circumstances, even when feeding is not intended. The animals are outspanned or off-saddled and knee-haltered. Usually they first give themselves a good shaking, lie down and have a roll, get up again,

and stale. The traveller having witnessed this recreation, and particularly noting that the staling has occurred, brings the animal to water when possible before inspanning again. This method of treatment repeated every second hour, together with the maintenance of a regular steady pace, invariably proves to be the best prevention of the ailment described. Working horses should not be fed up in preparation for certain work and kept confined to the stable without allowing them at the same time some sort of training. Horses bred in this country, which can be safely turned into the field, should be turned out accordingly, but imported horses, which are more liable to contract hemoglobinuria, should be put to some sort of work. It would require too many details upon general horse-keeping to specify all the causes which may lead to the ailments mentioned; it is sufficient to repeat that good management is the best guarantee against the evil.

In order to arrive at a successful method of treatment when the disease is present, the diagnosis must be made. In any and every case rest is most important. In paralysis of the bladder, friction with turpentine on the belly in front of the sheath and in its neighbourhood is recommended, as well as gentle rubbing alongside the urethra up to its root, also with the hand in the anus, as already directed; and in the anus, as already directed, and slightly pressing the distended bladder in a stroking motion towards the anus will help to break the cramp. Warm water should be injected into the anus, and the walls of the hind part of the stomach should be well rubbed. Internal warm drenches of tea or coffee are advisable. When the trouble affects horses that have been kept in the stable and is really caused through over-riding and inability to stale, I have found that leading the animal to a good bedding of straw or into the long grass will help it. It then seems to imagine that it is among stable litter, and very soon passes water.

In hemoglobinuria a good bleeding is recommended, followed by a general rubbing down with spirits of wine. An opening medicine should be given in the

form of Epsom or glauber salts, and two or three camphor balls. A mustard plaster should be placed on the loins. When there is retention of the urine a slight pressure should be made on the bladder, as above described. As soon as the animal can get up, it should be kept standing if possible.

In acute stiffness, thoroughly rub the legs for some time. A stimulant in the form of alcohol may be given.

In heat-wave a cooling-down treatment will have to be used. For this purpose water may be poured over the animal, and a good drink of water may also be given. Bleeding is recommended when the lung congestion is severe. Strong stimulants properly diluted may also be given.

In all cases proper diet in the shape of soft and easily digested food is recommended, and good nursing is sometimes more effective than all the medicine.

Pound Notices.

THE following stock, unless previously released, will be sold on the 4th March next:—

Nqutu.—White ewe goat; two sheep, no brands.

Moss Dale.—Brown mule (mare), no brands; brown mule, brand on left flank R and cast brand, on right shoulder N; bay Russian pony, hog mane, square cut tail, brand on left shoulder 5, on left flank cast brand; chestnut Russian pony, hog mane, square cut tail, left ear swallow tail, cast brand on left flank; dark mare, long tail, brand on right flank PU; dark mare, long tail, small white star, brand on right flank PU, on left flank HS; bay filly, about two years old, no brands.

Running on the farm "Spitzkop." Inadi, Krantzkop Division, the property of T. J. Nel, and reported to be too wild to be driven to the Pound.—Brown mare, with star on forehead, no brand or mark, about two years old, and not more than 13 hands high.

Howick.—Bay mule, small and thin. Mare, bay, branded R on left thigh. Mare, dun, branded, may be a cross or a X on left thigh, with filly foal. Mare, grey, with bay filly foal.

Pomeroy.—Mule, gelding, aged, about 13.3 hands, brown, black mane (hogged) and tail, black cross along back and across withers, white spot in front of off shoulder, broad arrow and indistinct mark over (probably cast, brand) near flank, V indistinct off shoulder. Half-bred goat (kapater), grey.

Pietermaritzburg.—Eleven mules—six mares and five geldings—they are all hogged maned and cut tails, brands indistinct. Among them is a light red roan mare, four white legs, white face, and branded with M off quarters, anchor on top of near quarters; a brown mare, with a large 5 off quarters; others with hearts, anchors, and brands indescribable.

Jaakal Spruit.—Angora goat, ewe, right ear swallow-tail and half-moon behind, left ear square cut out behind (Vingelhart); ewe kid of above, with same ear marks; white Kafir

goat, right ear swallow-tail, and half-moon and small slit behind, left ear slit and half-moon behind; white ram kid of above, half-moon behind each ear; blueish goat, ewe, right ear swallow-tail and half-moon in front; dark blue ewe kid of above, with same ear-mark as mother; mule, mare, dark chestnut, branded N on near hind quarter.

Meran.—Seven white ewe Kafir goats, A both ears, D right ear; three black ewe Kafir goats, A both ears, D right ear; blue ewe Kafir goat, A both ears, D right ear; black-and-brown ewe Kafir goat, A both ears, D right ear; white ewe Kafir goat, A both ears, D right ear; white ewe Kafir goat, A and D right ear; white ewe Kafir goat, A and D left ear; white ewe Kafir goat, D and C left ear; Blue ewe Kafir goat, A both ears; White ewe Kafir goat, A C right ear; white ewe Kafir goat, A both ears; dun-and-white she-goat, V in right ear, C left ear; white ewe, C right ear; white ewe, C left ear; white ewe; black-and-white ewe, D and C right ear; bay gelding, star on forehead, about 14 hands, white marks on back, no brands, sore back, aged.

Isipingo.—Mule, mare, light brown, 13 hands, small mane, switch tail, branded on near hind quarter. Pony, gelding, dark brown, lop-eared, hog maned, no brand, Russian type.

Meran.—Black-and-white billy goat, probable value 15s. White billy goat, probable value 10s. Blue billy goat, probable value 10s. The above animals will be sold at the expiry of one month from this date (31st January) if not previously released.

Moguntia.—Grey Stallion, probable value £10. Impounded by Tom Fynn on the 14th January, 1903. The above animal will be sold at the expiry of one month from this date (17th January) if not previously released.

Mooi River.—Friesland bull, black-and-white, long tail, white brush, piece out of top and slit in left ear, a nick in top and bottom of right ear, branded right hind leg PO, probable value, £15, impounded on the 28th by Jas Piccione, Greenfields, Mooi River. The above animal will be sold at the expiry of one month from this date (28th January) if not previously released.

Paspalum Dilatatum.

HIGH APPROVAL.

BELOW is what a friend, says "Agricola" in the *Witness*, writes me on *Paspalum Dilatatum*. It is very encouraging and seems to confirm all the accounts we have had of this grass as a valuable stock feed. There does not seem to be any great amount of trouble in growing this grass. The best way seems to be to plant the seed in beds and transplant the young plants. This means a good deal of work, but would probably mean a better crop of grass. I would be glad to hear from others who have tried this grass.

"I found something to please me very much at Mr. ———'s place, in the shape of successful *Paspalum*. He has just over three acres which were planted last year, and intends to plant 30 this year. The plants were put in rows 3 feet apart, 2 feet in the rows, and were fertilised and cultivated. Being so far apart it lay on the ground a good deal, but the stalks

were over 5 feet long. On this patch he put 19 cows, 19 calves, and his scuffling oxen, and it took them three weeks to fced it down; he had, however, to take off the calves part of the time as it was too rich for them. Earlier in the season he bought several oxen, they being very thin and poor; he put them in the *Paspalum*, and sold them in three weeks in good condition. He says the grass was green all last winter, and did not feel the frost at all; and that he believes that it would support three or four beasts to the acre all the year round.

"The few plants I have here have spread and entirely covered the soil, and would, I should say, crowd out anything else. It seems to me that this is going to be a most valuable thing in this country, and, if gone in for on any scale, should immensely increase the capacity of a farm for stock."

The King's Thoroughbreds.

HIS MAJESTY has in his possession at the present time three thoroughbred stallions, sixteen brood mares (with ten foals), eighteen horses in training, and a couple of steeplechasers at the Curragh, Ireland, one of these being Ambush, who won the Grand National two years ago, and will probably run for it again. The horses in training at Newmarket comprise—counting their ages from January 1st—one four-year-old, this being Nadejda, a sister to Persimmon, seven three-year-olds, and nine two-year-olds. Nadejda has never run, but as she is kept in training, hopes are evidently entertained that, with the maiden allowance, she may win one or more of the £10,000 races in which she is engaged next season. The three-year-olds include Mead, who ran well last season, and the two-year-olds are of the most fashionable lineage. The King is in the unprecedented position of owning three stallions, full brothers, in Florizel II., Persimmon, and Diamond Jubilee,

the two latter of whom are at the Sandringham stud, while Florizel II. is at Newmarket. These three horses are the sons of St. Simon and Perdita II., this mare having been purchased for the King's stud at the very outset for 900 gs. She has given a good return for the outlay, as her produce have won over £71,000, while the value of the three sires mentioned above is incalculable. Perdita II. is now dead, but among the sixteen mares in the Sandringham stud is the eight-year-old mare Azecza, who could not be trained, but is of great value for her blood. His Majesty also has at Sandringham such mares as Laodamia (by Kendal out of Chrysalis), Vane, a sister to Flying Fox (by Orme out of Vampire), Wheatley (by Orme out of Shotover), and Nunsuch (by Nunthorpe out of La Mortgage).

The Natal Creamery average milk test for the month of January was 4.3, which is equal to 20.81 lbs. milk to 1 lb. butter.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab Lungsickness	N. Grant ... P. G. Boshoff ... J. Wood ...	Brakfontein. Smalldeal. Pilgims' Rest.
J. Button	Estcourt, South of Bushman's River	Scab Lungsickness	P. Ballantyne ... J. B. Brewitt ... R. B. Wright	Weston Town Lands. Wagon Drift. The Alps.
K. Soutar ...	Portion of Lion's River	Scab "	C. J. Smythe ... J. Chadwick ...	Stratherne. Howard.
B. Vause ...	Ixopo ...	" " "	Dambuza ... Shelana ... J. P. Vause ... Ikonyela ...	Claybrooke Mackenzie. Thorninghurst. Springvale.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
R. J. Raw ..	Impendhle ...	Scab "	Mahandan ... Nomandindi ...	Impendhle Location "
A. H. Ball ...	Weenen ...	"	J. Crathorne ...	Beaconsfield.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
W. Wilson ...	Ipolela ...	" " " " "	J. Hayes R. M. & D. Arbuckle J. Morrison ... Earnshaw & Hilton C. A. Phipson ...	Glengariff Costmore. Glenmar. Pierremoot. Strath Campbell.
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Vanderplank ...	Lovedale.
G. N. Perfect ...	Umvoti, East ...	"	Thos. Hill ...	Stolzenvols.
A. S. Parkinson ...	New Hanover ...	Lungsickness	J. C. Watt ...	Newbrook
E. Varty ...	Umvoti, West	Scab	E. Simkins ...	Holmesdale

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 66 herds of cattle under license for Lungsickness, and 9 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	1 for Lungsickness, — for Scab
Klip River	...	...	13 2
Dundee	...	...	1 6
Umsinga	...	...	2 —
Upper Tugela (North of Tugela River) Division	...	...	— —
Zululand—Eshowe, Umhlazi, Lower Umfolosi, and Entonjaneni Districts	...	...	22 —
Nkandhla and Nqutu Districts...	...	...	21 1
North of White Umfolosi and Umfolosi Rivers	...	...	6 —
Total	...	...	66 9

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Modder Spruit.

Zululand.—Esbowe District, Umlalasi District, Mahlabatini District, Umfolozi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District.

Umsinga Division.—Location.

Krantskop Division.—Amobonvu Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 4th February, 1903.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of January, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same period from July 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Estcourt	97	51	4.80	12	2.30	6th	16.45	20.83
Nottingham Road	2.48	13	.70	6th	21.03	27.85
Adamshurst	98	54	1.93	15	.51	6th	12.22	22.41
Hilton	98	52	2.77	17	.65	24th	15.62	22.41
Mid Illovo	94	53	3.10	13	.90	28th	21.91	32.19
Mount Edgecombe	106	64	2.51	11	.77	25th	21.16	35.65
Cornubia	2.93	...	...	...	23.65	33.95
Milkwood Kraal	1.95	...	...	...	15.67	25.43
Blackburn	2.33	...	...	...	20.87	28.61
Saocharine	2.40	...	...	...	20.98	31.55
Prospect Hall...	2.02	...	...	...	18.27	23.06
Clairmont	1.85	6	.43	19th	22.14	33.10
Equeefa	101	63	20.91	18	.46	19th	20.91	29.92
Umzinto, Beneva	2.44	14	.62	28th	20.73	31.78

Gleanings.

It may not be generally known that sugar is employed in the manufacture of transparent soaps. The *Louisiana Planter* states that 150 lbs. of sugar are necessary for 1,000 lbs. of soap.

The Hungarian State Authorities hired out 200 stallions to private persons during 1901. These covered 7,000 mares, and the service fees amounted to £41 13s. per horse. The regulation number of mares to the stallion is thirty-five, so that £1 5s. is the average fee per mare.

The following advertisement appeared in a Pennsylvania newspaper in the days of slavery, over a century ago: "A complete coachman to be disposed of. He is an excellent driver, either postillion or on the box, is perfectly acquainted with the office of an hostler, huntsman, or waiter. He is healthy, strong, and honest. The only reason for his being sold is because he will get drunk now and then, though not frequently. Inquire of the Printer."

Of the insect injury to stored grain it has been estimated of Texas alone that there is an annual loss of over £250,000, and that nearly 50 per cent. of the corn of that State is annually destroyed by weevils and rats.

The milk records at Tring Park (England) for the past year show the following averages:—Thirty-one Jersey cows, 630½ gals.; forty-one Red Polls, 638½ gals.; twenty-five Shorthorns, 683½ gals. The highest yield of all was obtained from a Shorthorn cow which gave 10,573 lbs. These very high averages indicate what careful selection and management can accomplish.

The man who can use his weighbridge, says *The Farmer*, scores over the out-of-date method of buying and selling by guess work. What would a farmer think if he bought manures or feeding stuffs by estimating the quantity as well as the quality? or how would the butcher stand if he retailed it so much per piece instead of per lb.? He would be branded as a fool.

Market Reports.

Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

Whichever way one looks there is no denying the fact that a general depression faces one from every standpoint. Trade is far from being brisk. The drought still continues; there has been no rain for days past to be of any benefit.

Mealies.—Although mealies have been as low as 7s. 9d., 9s., and 9s. 7d. per 100 lbs. on the market, average Natal mealies have remained at 21s. and 22s. per muid. American mealies are offering in Durban at 18s. and 18s. 6d. per muid.

Hay.—This article is very scarce, and from all over the Colony comes the report that the country is as barren as the middle of winter. The prices during the past fortnight on the market have fluctuated between 5s. 2d. and 6s. 2d. per 100 lbs.

Forage.—Forage (inferior) has been as low as 5s. 9d. per 100 lbs., but good samples have realised from 7s. to 10s. 9d. per 100 lbs.

Potatoes.—Good tubers are far from abundant. Owing to the drought those coming to hand are small, and while some samples have been as low as 5s. 3d. per 100 lbs., others have reached 7s., 12s., and 15s. per 100 lbs.

Mabele.—Still a heavy demand for good samples, and prices have fluctuated between 9s. 9d. and 14s. 3d. per 100 lbs.

Lucerne.—From 1s. 9d. to 3s. 3d. per 100 lbs.

Onions.—Market fairly supplied, at prices varying between 4s. and 19s. 3d. per 100 lbs.

Butter.—Unless we soon get rain, and proper food is forthcoming for cows, one must expect butter to reach higher prices. Although some samples have been down to 9d. per lb., others have reached 1s. 8d., 1s. 11d., and 2s. 2d. per lb.

Tobacco.—Several small lots realised from 4d. to 6d. per lb.

Eggs.—From 1s. 2d. to 3s. 6d. per dozen.

Pumpkins.—From 4d. to 8d. per dozen.

Poultry.—Common fowls from 1s. 7d. to 3s. 6d. each; ducks, 5s. to 9s. per pair.

Sundries.—Mutton, 5d. to 10d. per lb.; pork, 3d. to 5½d. per lb.; rabbits, 9d. to 1s. 3d. each. Several mornings fresh fish was disposed of.

Fruit.—Apples, bananas, figs, grenadillas, grapes, mangoes, oranges, plums, strawberries, and pineapples.

Vegetables.—Beans, beetroot, cabbages, carrots, chillies, cucumbers, herbs, lettuce, marrows, mealies (green), onions, peas, radishes, rhubarb, and tomatoes.

Firewood.—From 8d. to 1s. 1d. per 100 lbs.

DURBAN.—Prices are:—Apricots, 2s. 6d. per 100; avocado pears, 1s. per dozen; apples, 2s. 6d. to 4s. 9d. per 100; bananas, 1s. to 1s. 6d. bunch; bananas, 2s. per 100; beans (red), 16s. per muid; beans, 4s. 6d. per basket; butter (fresh), 1s. 9d. per lb.; butter, 1s. 3d. to 1s. 4d. per lb.; cabbages, 3s. 6d. to 5s. 6d. per dozen; cauliflowers, 3s. 6d. to 5s. 6d. per dozen; ducks, 6s. 6d. each; eggs, 3s. to 3s. 7d. per dozen; fowls, 2s. 9d. to 6s. 6d. each; geese, 7s. 6d. each; grenadillas, 1s. per 100; grapes, 3d. to 6d. per lb.; ground nuts, 5s. 6d. per sack; guinea fowls, 11s. per couple; lemons, 5s. 6d. to 11s. 6d. per 100; lettuces, 1s. per dozen; limes, 1s. 6d. to 2s. per 100; mangoes, 1s. 6d. to 2s. per dozen; mealies, 20s. per muid; milk, 6d. per bottle; onions, 20s. per bag; oranges, 7s. 6d. to 10s. per 100; papaws, 1s. 6d. per dozen; peas (green), 4s. 6d. per basket; pigeons, 1s. 6d. to 1s. 11d. each; pigs, 32s. 6d. each; pigs (suckling), 11s. each; pineapples, 1s. to 1s. 6d. per dozen; potatoes (round), 11s. to 13s. 6d. per muid; potatoes (sweet), 5s. 6d. per muid; pumpkins, 3s. 6d. per dozen; tomatoes, 3s. 6d. to 7s. 6d. per basket; turkeys, 15s. to 21s. each; turnips, 6s. 6d. per bag.

Paspalum Dilatatum for Distribution.

THE Department of Agriculture has now a quantity of Paspalum dilatatum seed on hand for distribution in small quantities. Farmers wishing to avail themselves of this opportunity should address their applications to the Director of Agriculture, Maritzburg.

The cow is the last creature one would expect to see with earrings, yet every cow in Belgium has got to wear them. The Director-General of Agriculture has issued a regulation that all animals of the bovine species are to wear earrings as soon as they have attained the age of three months. This is a hygienic measure, intended to prevent the introduction into Belgium of animals suffering from tuberculosis. Breeders are to be obliged to keep an exact account of all animals raised by them, and the ring (on which is engraved a number) is fastened in the animal's ear for the purpose of preventing—or helping to prevent—the substitution of one animal for another.

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AND MINING RECORD.

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Reading Cases for holding a year's issues of the "Agricultural Journal," leather back, cloth sides, 26 strings, lettered on side, 1s. each. Binding yearly volumes in cloth, 2s. 6d. each.

NOTICE.

The attention of Readers is called to the reduction in the Publishers' Prices for Reading Cases and for the Binding of Yearly Volumes.

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Manure Experiments at the Natal Central Experiment Farm.

BY THE DIRECTOR OF AGRICULTURE.

ON the following page appears a reproduction of a photograph of some experiment plots at the Central Experiment Farm, Reit Spruit, near Hilton Road. Each plot is a long narrow strip of land 408½ feet in length and 10 feet 8 inches in width, having therefore an area of 1-10th acre. The crop shown in the photograph is maize, and there are four rows in each plot. The crop was

sown on the 25th November, and the photograph was taken on the 9th January, that is six and a half weeks after sowing. The plot on the right of the picture, namely, Plot 4, which shows luxuriant growth, had been manured; that to the left, namely, Plot 5, which shows poor growth, had received no manure; it represents the natural productiveness of the newly broken veld. To the left of this

again is another manured plot ; and still further again to the left can be seen in the distance other plots, both manured and unmanured.

No one can look at the picture without vividly realising the effect of manure on such a soil as that experimented upon. At the time of writing this article, twelve weeks after sowing the crop, the effect is still more striking than shown in the picture. Many of the plants in Plot 4 are now nearly 8 feet high, while very few on Plot 5 are 4 feet high. Considering the unfavourableness of the season, the growth on Plot 4 is highly gratifying, whereas that on Plot 5 is probably just on the border line between profitable and unprofitable agriculture. The real test will, of course, be at harvest time, when the crop from each plot will be separately harvested and weighed. Plot 5 may then perhaps come up to the present average mealic yield of Natal, namely, 4½ muids to the acre ; and Plot 4, it may be, will come up to what we can perhaps look forward to as a possible future average, namely, 12 muids to the acre. If such an average should ever be attained, if so desirable a consummation should at any time result from the work of the Experiment Farm, then the people of Natal will readily recognise that farm as a most profitable and useful institution.

Now, I should like to explain to the farmers of Natal something more in detail about the manure plots, and beg their patience and attention to that end. I have no wish to go into what to them may appear too scientific, or abstruse, or theoretical ; but I have always found a well planned set of manure plots to be of the deepest interest to the intelligent farmer when properly explained to him.

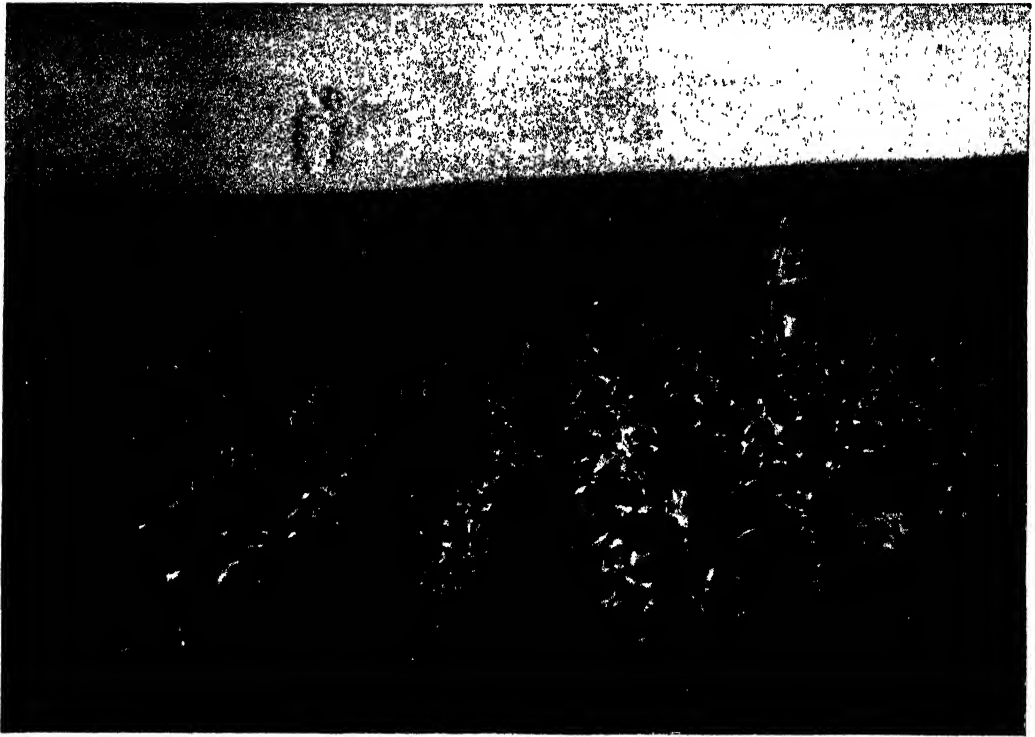
There are two kinds of manure plots. In one kind a man obtains samples of various manures without knowing what there is in them, puts them on plots of his land, sees on which plot there is the best crop, and then says, that is the manure for my land. Such a system of experiment, if system it can be called, very often provides the manure vendor with a valuable advertisement, and leads to the farmer getting the minimum effect with the maximum outlay. In the other

system the plots are so arranged that the farmer who once takes the trouble to properly understand them learns straight away the essentials of the whole art of manuring, gets to understand what it is that plants require as their food, and at the same time obtains a practical analysis of his soil, of more value to him than any laboratory analysis ever can be under existing conditions, and finally he is shown the best combination of manures to produce on his land the maximum effect at the minimum cost.

All land plants take out of the soil eight elementary plant foods. Some of these plant foods are contained in all soils in practically inexhaustible quantities, and need never be supplied in the form of manure. In practice it is found that only three of these plant foods need attention ; these three are Nitrogen, Phosphoric Acid, and Potash. Many farmers in Natal already know the names of these three elementary plant foods. Every farmer should know them. It is as irrational for anyone to undertake to grow crops without his knowing the names of these three important substances which plants require to feed upon as it would be for a banker to undertake banking without knowing the names of the coins of the realm. It is necessary then to fix in one's memory the names of these three important plant foods, Nitrogen, Phosphoric Acid, and Potash.

If an ordinary soil contain enough of these, it will, in a favourable season and with proper cultivation, produce maximum crops. If it lack any one of them, it will produce poor crops, no matter how much of the other two it may contain. A set of manure plots should be so designed as to show which of these, if any, is lacking, and how much the soil requires in order to produce the maximum effect.

A manure containing all three of these plant foods in the proportions required by crops is called a Complete Manure. If we take two plots of ground as nearly alike as possible—and this condition is best obtained by making the plots, as shown in the photograph, in the form of long thin strips running alongside each other, so that they will cut through the same irregularities of soil—and if we



Plot 5, Unmanured.

Plot 4, Manured.

EXPERIMENTAL MANURE PLOTS

at the

CENTRAL EXPERIMENTAL FARM, NEAR HILTON ROAD.

treat these plots precisely alike in the matter of cultivation and sowing, but to the one plot give a complete manure and to the other give none, then if from the manured plot we get a better yield than from the unmanured, we know that the soil is lacking in one or more of these three plant foods. But we should not know whether it were the nitrogen or the phosphoric acid or the potash, or any two of these, or all three, that was lacking. How then should we find which of these was required? Should we find out if nitrogen were required by putting nitrogen on to another plot and comparing the result with that obtained from the unmanured plot? No; for the soil might need phosphoric acid also, or potash also; and if it did no amount of nitrogen given by itself could produce any increase of crop. It might indeed, if given by itself, produce such a disturbance in the balance

of growth as to result in actually less crop than that obtained from the unmanured plot. We should find out if nitrogen were required by giving to a third plot the same amount of phosphoric acid and potash as was given to the first plot, but leaving out the nitrogen; then, if the third plot gave a less yield than the first, it would be evident that nitrogen was needed. This will be best shown by means of an illustration. Suppose that our three plots yielded as follows:—

	Yield of Meals. per acre.
Plot 1, Complete Manure—Nitrogen, Phosphoric Acid, Potash ...	12 muids
„ 2, No Manure ...	6 „
„ 3, Same as Plot 1, but no Nitrogen	6 „

Clearly from Plot 1, as compared with Plot 2, it would be seen that some manure was needed; and from Plot 3, as compared with Plot 1, it would be seen that

gen, Plot 5 will yield as much as Plot 2, and we shall naturally conclude then that nitrogen manuring is unnecessary. If, on the other hand, we get no better result off Plot 5 than without any manure at all, we shall say that all the nitrogen given on Plot 2 is needed. If we get an intermediate result, then we may conclude that only a portion of the nitrogen given on Plot 2 is necessary. Plot 2, in the above given returns, yielded an increase of 159 per cent., but Plot 5, to which no nitrogen was given, yielded an increase of only 107 per cent. We should say that some nitrogen was necessary; but not the full dressing; probably one-third of the full dressing would have been enough. Similarly, Plot 6 shows us the requirement in respect of phosphoric acid. We see that without phosphoric acid there is practically no better result than with nothing at all; there is a gain of only 10 per cent., instead of 159 per cent. In such a case we need have no hesitation in assuming that all the phosphoric acid given on Plot 2 is necessary. Plot 7, without potash, gives exactly the same result as Plot 2, with potash. Clearly, from such a result, we may conclude, that potash manuring is unnecessary.

Border Plot.

- | | |
|---|--|
| Plot 1, Complete manure, light dressing | { 85 lbs. per acre Sulphate of Ammonia for Nitrogen, ¹
150 lbs. " Superphosphate for Phosphoric Acid.
50 lbs. " Potash Chloride for Potash. |
| " 2, No manure. | |
| " 3, Complete manure, medium dressing (twice as much as on Plot 1). | |
| " 4, " " heavy dressing (three times as much as on Plot 1). | |
| " 5, No manure. | |
| " 6, Same as Plot 3, but no Nitrogen. | |
| " 7, " " Phosphoric Acid. | |
| " 8, No manure. | |
| " 9, Same as Plot 3, but no Potash. | |
| " 10, 300 lbs. Superphosphate only. | |
| " 11, No manure. | |
| " 12, 300 lbs. Basic Slag. | |
| " 13, 300 lbs. Bone-dust. | |
| " 14, No manure. | |
| " 15, 10 cwt. Lime. | |
| " 16, 10 cwt. Lime, and same as Plot 3. | |
| " 17, No manure. | |
| " 18, 10 cwt. Lime, and same as Plot 10. | |

Border Plot.

On Plot 10 the superphosphate has acted much more quickly than the slag on Plot 12, and this again has acted more quickly than the bone dust on Plot 13. The superphosphate on Plot 10 has not acted quite so well as the superphosphate mixed

"Plot 8 is a duplicate unmanured plot. If it gives practically the same result as Plot 3, we have confidence that the experiment has been properly carried out. If, however, the results of these duplicate plots do not agree within reasonable limits, we shall place less reliance on the whole experiment. In such case the test must be carried out with greater care the next season.

"A field experiment laid out on a plan such as this is a scientific experiment; and I think no one, after following the explanation of it, will deny it the merit of being practical."

It is a fact of practical interest that the results on the maize manure plots at the Natal Central Experiment Farm are coming out very much the same as the Victorian general average results above quoted; they are showing that the soil is very much in need of phosphoric acid, that it needs some nitrogen, and no potash.

There are several hundreds of plots at the Experiment Farm. Those represented in the photograph are from a set of 18, of which the following is a detailed statement:—

with sulphate of ammonia on Plot 9; the plants are somewhat less in growth, and are a paler green. It is evident, therefore, that some nitrogen is needed, though how much is needed cannot be stated until the plots are harvested. It will probably be more economical to supply the nitrogen

by means of leguminous crops grown with the mealies than by means of sulphate of ammonia. The lime on Plots 15, 16, and 18 has apparently done no good at all.

In Victoria these experiment plots were not confined to experiment farms, but were laid out on private farms all over the country. They were exceedingly popular amongst the farmers, it being declared in many districts that they had effected a revolution in the agriculture of the

districts. In the last season of my operations there I had sent out field operators to lay out 370 of these experiment or demonstration fields, and had to refuse another 100 applications owing to want of funds. Next season it is hoped it will be possible to make a start in this direction in Natal, though, owing to the scarcity of railway and transport facilities, it may not be possible to work on so wholesale a scale as was done in Victoria.

Moving Cattle South of the Tugela.

NOTICE.

IT is hereby notified, that cattle from Klip River County are now allowed to come south of the Tugela River upon written permit from me and subject to the following conditions:—Owner must make written application to this Office stating where his cattle are running, giving number and description as far as possible, and stating accurately where it is proposed to run them south of the Tugela (name of farm and District to be

given). Only owners whose cattle have been free from disease for three months or more and who are prepared to quarantine their cattle for six weeks after arrival of the cattle south of the Tugela should apply.

S. B. WOOLLATT,
P.V. Surgeon, Natal.

P.V. Surgeon's Office, Pietermaritzburg,
16th February, 1903.

District Reports.

EMPANDHLENI, 31st January.—The weather has been very warm and dry during the month. The total rainfall was 1.10 inches. The maximum temperature was 93 degrees, and the minimum 40 degrees. A wife of the Chief Matshana ka Mondisa was killed by lightning whilst standing in front of her hut on the afternoon of the 25th inst. Crops are at a standstill for the want of rain; the standing crops in the District that were looking very promising last month are now parched, and unless we have a good downfall of rain soon the whole of the crops will prove a failure, which will be a most serious matter for the Natives, as already grain is very scarce, and Natives are buying from traders at the rate of £2 per muid. Several wagons with grain visited the District during the month from the Eshowe and Melmoth Districts. Hopper locusts were reported to be hatching out in the ward of the Chief Ndube, but as yet no damage has been reported as having been done by them. There have been no fresh cases of lung sickness. Rinderpest appears to be on the decrease; only one fresh

outbreak was reported during the month, in the ward of the Chief Nonzama. The Natives, I regret to say, in places are still averse to inoculation, and in many cases absolutely refuse to have their cattle inoculated, preferring to doctor them themselves, whilst others plead inability to pay the Government charge of 6s. per head. A suspected case of smallpox was reported in the ward of the Chief Moses; the kraal was immediately quarantined, but on further examination it was found that the Native was suffering from a venereal disease. Several children of the kraal of the Chief Siswana are suffering from a disease known as conjunctivitis, or severe inflammation of the eyes, four deaths having taken place from this cause, but under the treatment of the District Surgeon those now ill are progressing favourably. Colds, as usual, have been very prevalent during the month. The Chief Sitshitshili reported that fifteen goats were stolen from his ward on the night of the 31st ultimo.

CHAS. MCKENZIE, Acting Magistrate.

LOWER UMFOLOZI, 3rd February.—The weather generally during the past month has been very hot, windy and dry; only slight heat showers fell on the 1st, 6th, 13th, 18th, 20th, 26th, and 27th. On the 25th the temperature was slightly over 100 degrees in the shade, and the same evening a perfect hurricane blew from the S.S.W. The drought has been terrible, and it is feared the crops, which promised so well recently, will fail to produce half the harvest expected of them. Chief Msiyana complained that the water supply in his location had all but run out, and Natives were greatly perturbed in mind at the sweating blight in their amabele and imfe crops. They were, however, told that twenty-five years or so ago a similar extraordinary visitation occurred in Natal owing to drought, but with no serious after effects. Imfe so blighted does not taste properly sweet, nor the amabele seed; the stalks of both become red and rusted, and from the leaves oozes forth a sticky moisture, on which minute germs start to feed—keeping to the under side thereof—and rapidly destroy same. "Ntotoviana" locusts, strange to say, took the place of Egyptian, which latter appear to have absented themselves from the District for a term. Among stock 64 deaths were reported among cattle from rinderpest, two among koodoo; one beast affected with the pest was killed for bile, and one suspect case ended mortally. Further, there was one death from lung sickness and one recovery, one death from redwater and one from poisoning by eating caddis-worm; and, finally, one from a catarrhal mortification of the nostrils to the brain, in an old cow. Two goats were killed by a leopard, and two by wild dogs; while one riet and one boschbok were destroyed by the latter four-footed pests. Two wild dogs in turn were shot by a Native game conservator, who states he got among a pack and hit eight altogether.

A. R. R. TURNBULL, Magistrate.

MAHLABATINI, 8th February.—The weather has been pleasant on the whole, a fair amount of rain having fallen during the first fortnight, but the latter part of the month has been dry—strong north winds prevailing on several days. Stock is looking exceedingly well, but I regret to say that rinderpest is spreading in the southern portion of the District, several fresh outbreaks having occurred during the last week. The boundaries of the infected area on the Nkonjeni consequently required alteration, and now a large portion of Ngobozana's location is included therein. I am pleased to be able to report, however, that in the northern parts of the District, where rinderpest first made its appearance, all cattle are now free from the pest. Mr. K. Ripley, the Government Inoculator for this portion of the District, having treated some 420 head of cattle during the month, a considerable number of these having been gone through twice. Two out-

breaks of lung sickness occurred, one at Cezwa and one near Chief Tshanibezwe's kraal. The mealie crops are looking well, and "green mealies" are being enjoyed at a number of kraals in the District. The scarcity of food of late renders their advent all the more appreciable. The amabele has been attacked by an insect, which the Natives describe as a small beetle, having laid its eggs on the leaves and caused them to droop. It is to be hoped that it will not affect the crop materially, but the Natives are very doubtful on this point, and fear the worst. The skeleton of a white rhinoceros was found by the game supervisors in the reserve. It appeared to be a full grown animal, but the cause of its death remains a mystery. Game of all kinds is abundant; the guards report having seen a herd of 30 koodoo near the Reserve. No rinderpest has as yet made its appearance in their midst.

R. H. JACKSON, Magistrate.

NEW HANOVER, 17th February.—Fine rains have fallen in the nick of time to save the crops. However, several springs, which used to give water, are still dried up. Stock on the whole is in good condition. One case of gallsickness was reported to me.

A. RITTER, Magistrate.

WEENEN, 14th February.—The weather has been very hot and dry. Late showers have fallen on occasions towards evening; these have helped to bring on a few plots of tobacco and mealies in the village and on the blocks. The last hailstorm threw all into disorder, and all but absolutely ruining a great many of the inhabitants, who were, this year, expecting to recoup themselves after the heavy blow dealt them by the hailstorm of April, 1902. Two severe hailstorms virtually traversing the same ground within nine months of each other will be acknowledged demoralising. Growing mealies and tobacco were hewn to the ground. The stalks of the latter were cut back, and a secondary crop appears to be coming on. From this a greater crop is expected. Glanders broke out in the Police stables in Weenen and at Mr. Otto Rottecher's, Golden Valley; at each place two horses were destroyed by order of the District Veterinary Surgeon, Verney, of Mooi River, who spares no trouble and energy to explain to those interested the different features of the disease. The drought is general throughout the Division, and the crops look miserable. I anticipate a considerable shortage of grain amongst the Natives. Hundreds of able-bodied Native men are leaving the Division monthly for service in Johannesburg and elsewhere out of the Colony. A considerable certain revenue is missed by the non-charge of a substantial fee, and a justifiable fee for each pass given to seek work beyond the borders of this Colony.

R. ERNST DUNN, Magistrate.

Pound Notices.

THE following stock, unless previously released, will be sold on the 18th March next:—

Berlin.—Bay mule (gelding), branded U on neck, and I over R on near side, about 13 hands high.

Weenen.—Brown cow, white on belly, brand C.E. (reversed) on left hindquarter; dark brown mare, branded D.M. on off hindquarter, short mane, long tail; bay mare, three white feet, white star on forehead, flea-bitten, brand looks like J.T. right shoulder, impounded by Natal Police, supposed to have been stolen.

Nqutu.—Three white goats, black-and-white goat.

Dundee, running on farm East Lynne.—Schimmel mare, branded indistinctly P2 on right buttock, with foal at foot; red ox, white under belly, branded J' or JG on right buttock; light bay mule mare, near fore leg deformed, no brands visible.

Moss Dale.—Grey gelding, brand on right flank indistinct, looks like G L or C2; bay gelding, with leather neck-strop on, blind in left eye, branded S U on near shoulder, and two east Government brands on near hip; brown gelding, branded R on off shoulder, east Government brand near hip, with leather neck-strop on; chestnut gelding, right hoof deformed, no brands; dark brown mule (mare), branded on left hip B N, on left side of neck VD, on right side of neck looks like 7168B.

Harding.—Grey mare, aged; bay filly; young black bull toli.

Dronk Vlei.—Dark bay gelding, two white hind feet, cut tail, long mane, about 14.2 hands, and about 8 years old, brand on left hip, Government east brand; black goat, about 8 months old, one cut on left ear.

Petroscar.—Grey pony colt, about 3 years old, square cut tail, nick out of right ear (half moon front), no brands.

Weenen.—Black-and-white bull, about three years old, no brand, probable value about £8; impounded by C. P. F. Van Rooyen, "Mona," Weenen Division, on the 24th January. The above animal will be sold at the expiry of one month from this date (31st January) if not previously released.

The following, unless previously released, will be sold on 1st April next:—

Ladysmith.—Light bay mare, blaze on face, front fetlocks white, off hind leg white stocking, branded on off hindquarter PG, about 13 hands 3 inches, tail and mane medium length and dark; black-and-white Madagascars ox, indistinct brand on off hindquarter, ears slit, poor in condition; light bay gelding, Russian bred, with dark points, heavy tail, been cut square, mane been hogged, branded R on right shoulder, broad arrow on near hindquarter.

Springfield, on "Potgieter's Drift," Tugela River.—Chestnut horse, branded R on left shoulder, and H on left cheek, cut mane, white mark on nose.

Howick.—Red-and-white ox, branded (might be M1 or MK) on off rump.

Greytown, on farm "Mount Alida," Reit Vlei.—Dark bay mare, branded V on left hip and R right shoulder.

AMENDED POUND NOTICE.

In *Government Gazette*, January 20th, the black cow advertised under Government notice No. 48, 1903, should read as under:—Black cow, white patch on both sides, white on forehead and under belly, branded recently on near hindquarter L over 27, old brand C1 on off quarter, O-G on off shoulder, broad arrow on off quarter with half tail, marked on both ears, has red bull calf at foot.

Mooi River.—Three rams, appear to be cross-bred Merinos; two with indistinct brand on rump, seems like NO.; one with no brand visible; all with right ear squared and piece out of bottom side of left. Impounded by J. E. Oates, Evansdale, 4th February, 1903. Estimated value, 30s. each. The above animals will be sold at the expiry of one month from this date (10th February) if not previously released.

Moss Dale.—One black bastard Zulu bull, aged, no brands. Probable value, £8. Impounded by Sekele (Native), on 4th February, 1903. The above animal will be sold at the expiry of one month from this date (9th February) if not previously released.

Howick.—Black white-faced ram goat, probable value 10s. Impounded by E. Parker. The above animal will be sold at the expiry of one month from this date (13th February) if not previously released.

AMENDED POUND NOTICE.

Petroscar.—Grey pony stallion, about 3 years old, square cut tail, half moon front right ear (nick). Probable value, £8. Impounded by Unihlegone, Chief Nondobella, on the 29th January, 1903. This animal was described as a colt, and wrongly included in my return published under Section 38 of Act 42, 1898, in the *Gazette* of the 10th instant, and will be sold at the expiry of one month from this date (13th February) if not previously released.

With reference to the quality of bone dust imported for the Noodsberg Road Agricultural Association by Messrs. F. and G. Reiche, and guaranteed to contain nitrogen 1.00 and phosphoric acid 32.00, Mr. Alex. Pardy, Official Analyst, Agricultural Department, gives the following analysis from samples sent to him: Nitrogen, 1.18; phosphoric acid, 33.19.

Collect on Delivery.

SEVERAL requests from readers to publish the C.O.D. rules of the Cape Colony have been received, and, in response, we take on the following:—

CAPE GOVERNMENT RAILWAYS.

BY-LAWS AND REGULATIONS.

17. Collect on Delivery System (C.O.D).—The Department undertakes to collect from consignee and hand over to sender the declared value of consignments other than live stock—less commission charges—forwarded under the “C.O.D.” System.

Rates of Commission.—The rates of commission for collecting from consignee on behalf of sender the amount to be recovered in respect of the value of the consignment are:—

Not over £1	3d.
„ £2	4d
„ £5	6d.
Each additional £ or part thereof	1d.
Maximum, £100.	

These rates are payable even though the collection of value is not effected, to recompense the Department for services which, though ineffectual, will exceed those rendered if the consignment were delivered in the first instance.

Sender's Duty.—A sender wishing to take advantage of the “Collect on Delivery System” will hand the package, fully and legibly addressed, which he wishes forwarded, to the Officer at the Sending Station appointed to receive the same, together with a consignment note, which, in addition to the usual particulars, must show the amount to be collected from the consignee for and in respect of such package, irrespective of railway freight, any special instructions regarding the delivery, etc., he desires carried out, together with an account giving detail of contents of such package or packages.

It is recommended that for the latter purpose the ordinary commercial bill-head or invoice form be used.

13. Non-payment of Charges by Consignees.—If, when goods are tendered for

delivery, the consignee cannot be found at the place to which they are directed, or if he neglects or refuses to pay for the carriage thereof or other charges thereon, the Department reserves the right to detain and deposit such goods on their own or any other premises, but at the expense and risk in all things of the consignee, and with or without notice to sell the same or any part thereof; or, if the same shall have been delivered without payment, to detain and sell any other goods, articles and things which shall be or afterwards come into the possession of the department for the consignee, and out of the money arising from such sale to retain all money due to the Department and all charges of obtaining and keeping possession of the said articles and things, on demand, rendering the surplus cash (if any) arising from such sale, and any articles, goods, or things unsold, to the party entitled thereto.

14. Ledger Accounts.—The Department is prepared to open monthly Ledger Credit or Freight Accounts with merchants, traders and others who are in the habit of regularly forwarding by rail considerable quantities of goods, etc., on their application to the Traffic Manager of their System, and upon the following conditions, viz.:—

(a) The application is to be made in writing on a form obtainable from the Traffic Managers.

(b) The applicant must guarantee that his Ledger Account shall not exceed in any one month a certain sum to be fixed by him.

(c) The applicant must—

1. Make a payment on account

2. Furnish Cash Security

To the extent of the amount of six weeks' traffic calculated upon the basis of the guarantee furnished by himself as per preceding clause (b); or

3. Furnish the written guarantee of a Bank Manager that the bank will hold itself liable for the amount of six weeks' traffic fixed under Clause b, and give the Department fourteen days' notice of the

Bank's intention to cancel such guarantee.

(d) All accounts for freight must be paid in full not later than on the day after presentation.

(e) No deduction whatever may be made on the ground of alleged overcharges, unsettled claims, or any other cause.

The following is a "Notice for Distribution" issued by the Cape Government Railways :—

COLLECT ON DELIVERY (C.O.D.) SYSTEM.

Attention is invited to the Railway facilities offered to the public by what is known as the "Collect on Delivery" system, whereby the country is brought into more direct communication with the town; the Railway Department undertaking to collect for the seller the value of the goods from the purchaser.

The system enables farmers and others in the country, on the one hand, to supply directly to residents in town produce such as butter, eggs, milk, fruit, vegetables, cheese, etc., and, on the other hand, to obtain directly from the towns merchandise and other necessities, and is of mutual convenience and benefit to both.

Briefly stated, the "C.O.D." system is as follows :—

1. Mr. Brown, of Cradock, wishes to obtain a box of oranges from Mr. Jones, of Cookhouse. He accordingly writes to Mr. Jones to send a box of oranges "C.O.D." by railway. Mr. Jones takes the oranges to the Stationmaster at Cookhouse, hands in the usual consignment note with an ordinary bill-head showing the value of the oranges, say 10s., which he wishes collected from Mr. Brown, of Cradock, receiving therefor a receipt from the Department. The Railway Department conveys the package to Mr. Brown, of Cradock, receives from him the railway freight (unless prepaid by sender), and the value of the oranges which Mr. Jones desires collected (10s.), and pays over to Mr. Jones the 10s., less 3d. commission, or 9s. 9d.

2. Mr. Smith, of Dohne, orders a suit of clothes from his tailor, Mr. Robinson, in Queenstown. Mr. Robinson delivers the parcel at Queenstown Railway Station, hands in the usual consignment note with

an ordinary bill-head showing the value of the parcel, say £5, which he wishes collected from Mr. Smith, of Dohne, receiving therefor a receipt from the Department. The Railway Department conveys the parcel to Mr. Smith, of Dohne, receives from him the railway freight (unless prepaid by sender), and the value of the suit of clothes which Mr. Robinson desires collected (£5), and pays over to Mr. Robinson the £5, less 6d. commission charged for the service, or £4 19s. 6d.

COMMISSION.

The rates of commission for collecting from consignee on behalf of sender the amount to be recovered are :—

Not over £1	3d.
" £2	4d.
" £5	6d.
Each additional £ or part thereof, 1d.	

Further particulars can be obtained from Station Masters and Traffic Managers, or the Cape Government Railway Tariff Book, Clause 17.

"This day," says a correspondent of the *Old Sporting Magazine*, on January 9th, 1835, "I had another convincing proof of how much blood tells in carrying weight. Major Wyndham, of the Greys, stands 6ft. 2 in., and rides about 17 stone I should think. He was, on this day, on a little chestnut mare of about 15 hands, which he bought for twenty pounds out of a coach; but to see this creature carry him, with his long legs nearly on the ground, over some of the fallows we had this day, with his head quite loose, was the most extraordinary thing I ever beheld; and she went fresh and strong to the end."

A wonderful ride was accomplished by Mr. Cowper Thornhill, of the Bell Inn, at Stilton, on April 29th, 1745. An inscription on a print of the time tells us that he started from Stilton at four in the morning, rode to London, 71 miles, and reached the Queen's Arms, opposite Shoreditch Church, in 3 hours 52 minutes, returned to Stilton in 4 hours and 12 minutes, and came back to London in 4 hours 13 minutes. He thus won easily his bet of 500 guineas that he would perform this feat in fifteen hours. The race excited great interest, and it is said that the road for miles was lined with people waiting to see Thornhill pass.

Plain Talk about Horses' Teeth.

MR. S. R. HOWARD, in *The Station, Farm and Dairy*, writes :—

In no department of study and research has there been more advancement in recent times than in the care of horses' teeth, and the amount of animal misery prevented and relieved by means of discoveries in this direction is almost beyond estimate. I know what I am saying when I state that too little attention is given to this subject, and I counsel those who have such charges by no means to disregard my advice. The mare has, in all, 36 teeth; the horse 40. Each has six incisors above and below. At about the age of three to four years the horse sheds eight and gets 12 grinders. Think of such a severe change! Is it any wonder that at that age a horse is so hard to keep on edge? At this time may be noticed enough, diarrhoea, constipation, catarrhal disorders, swelling and abscesses about the face and head, eruption of the skin, irritation of the eyes, urinary disturbances, loss of appetite, difficult chewing, nervousness, sore throat, and general depletion. When any of these symptoms are present a careful examination of the mouth should be made.

The practice of caring for horses' teeth is not as general as it should be, and especially is this true in the country. In cities, on race tracks, and horse farms, the teeth receive particular attention. There is quite a fashion of late years in some countries to have horses' teeth regularly "floated" or "rasped" by veterinary "dentists." In some instances this is very beneficial, while in most cases it is entirely unnecessary. From the character of the food, the rubbing or grinding surface of the horses' teeth should be rough. Still, we must remember that the upper jaw is somewhat wider than the lower, and that from the fact of the teeth not being perfectly opposed, a sharp ridge is left unworn on the inside of the lower molars, and on the outside of the upper which may excoriate the tongue or lips to a considerable extent. This condition can be readily felt by the hand, and these sharp ridges, when found, should be rasped

down by a guarded rasp. This is often done without the aid of the veterinarian. There are many good veterinarians who have given this subject a great deal of thought and study, and with the aid of improved instruments are thoroughly competent in this particular line. At the same time there is scattered about the country an itinerant tribe of daring pretenders dabbling in veterinary business, wholly lacking in skill to comprehend or operate correctly upon horses' teeth.

If anything is wrong with your horses' grinding, take him to the best veterinarian (genuine article) you know, tell him all you have noticed about it, and have him thoroughly examine the horse's mouth. Beware the "dentist" who solicits the privilege of examining your horse's mouth. He has arguments that have never been dreamed of in your philosophy. Every horse's mouth he feels or peers into requires (?) his services. He has dark designs upon your pocket book. I am acquainted with a wag of a farm hand who led the same slightly disguised horse out of three different doors of the barn, and the "dentist," not recognising the horse, was each time positive the horse's molars should be dressed, yet only a week before, 20 miles distant, he had "dressed" this same horse's teeth. I may have been unfortunate in my experience, but in 17 years of practice I have yet to meet a travelling "dentist" who, to my notion, was a conscientious operator, or possessed the knowledge or skill to which he pretended. As a rule, he is a wandering Ishmaelite, the Bengal tiger of veterinary science, and continually seeks "green fields and pastures new." In fact, horsemen sometimes have been so grossly imposed upon by this new quackery that often anyone making any claim to knowledge of a horse's teeth is looked upon with poisonous derision, and consequently unappreciated. This, of course, is unfair to qualified men who are well grounded in fundamental facts. A horse's permanent grinders when matured are two to four inches long, and when normal but little above the gum. Their roots

do not begin to grow until about the seventh year. As the animal grows older, whether the molar has an opposite to grind upon or not, it is forced into the

mouth; and, in time, if the opposite tooth is long, this grinder may be several inches longer than its fellow.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of January, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Jan. 5	Seed Potatoes	601 cases	London	Oronsay	Free of Pest.
" "	Rose Trees	5 "	"	"	" "
" "	Seed Potatoes	934 "	"	Umfuli	" "
" "	Grapes	375 bariels	"	"	" "
" "	Oranges	50 cases	"	Inyati	" "
" 6	"	162 "	"	"	" "
" "	Seed Potatoes	489 "	"	"	" "
" "	Table "	924 "	"	"	" "
" "	Apples "	1 case	"	"	" "
" "	Table Potatoes	100 cases	"	Hydaspes	" "
" "	Seed "	100 "	"	"	" "
" 9	Ornamental Plants for Trappists, Pinetown	1 case	Hamburg	Kanzler	" "
" "	Seed Potatoes	375 cases	London	Afghanistan	" "
" "	" "	30 hampers	"	"	" "
" "	Grapes	25 barrels	Liverpool	Clan Matheson	" "
" "	Potatoes, Seed	40 casks	London	Umloti	" "
" "	" "	200 hampers	"	"	" "
" "	" "	672 cases	"	"	" "
" "	Willow Trees, etc., Mrs Crompton, Pinetown	1 case	"	"	" "
" 15	Seed Potatoes	30 cases	"	Umsinga	" "
" "	Fresh Apples	1 case	"	"	" "
" "	Seed Potatoes	301 cases	"	White Cross	" "
" "	" "	114 "	"	Hortensius	" "
" "	Grapes	100 boxes	"	"	" "
" 17	Mango Trees, etc. ...	5 pkgs.	Calcutta	Umkuzi	" "
" "	Seed Potatoes	30 cases	Australia	Orange Branch	" "
" "	Potatoes	81 "	London	Inyoni	" "
" "	Rose Trees	1 cases	"	"	" "
" 22	Fresh Fruit, Plums, etc.	185 crates	Cape Colony	Kildonan Castle	" "
" "	Apples	100 cases	"	"	" "
" 23	Potatoes, Table	4 cases	Hamburg	Kurrachee	" "
" "	Apples	50 barrels	Montreal	Melville	" "
" 28	Potatoes, Table	5,500 cases	Trieste	Oarinthia	" "
" "	Oranges	242 "	"	"	" "
" "	Lemons	245 "	Sydney	Sophocles	" "
" "	Oranges	300 "	"	"	" "
" "	Plums	9 "	"	"	" "
" "	Apples	116 "	"	"	" "
" "	Oranges	60 "	Naples	Kron Prinz	" "
" "	Lemons	35 "	"	"	" "
" "	Limes	100 "	"	Reichstag	" "
" "	Lemons	350 "	"	"	" "
" "	Oranges	50 "	"	"	" "
" 29	Apples	1 case	Liverpool	Prome	" "
" "	Rose and Apple Trees, Jas. Alexander, Harri-smith	1 bale	London	Guelph	" "

C. B. JONES, Examining Officer.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of January, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised. tons. cwt.	
	Above Ground.			Below Ground.							
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Elands Laagte ...	11	17	160	13	124	280				9,619	4
Dundee Coal...	15	14	120	15	114	355	1	15	58	8,917	7
Natal Navigation ...	21	48	126	16	237	88	11	23	0	7,545	19
St. George's ...	12	76	71	6	150	84	2	10	2	4,848	0
Glencoe ...	13	63	81	8	161	6	4	44	0	3,800	0
Natal Marine ...	7	73	8	8	202	5				3,621	13
No. 42 ..	8	21	13	2	99	0	0	4	0	2,122	12
Newcastle ...	4	10	10	5	70	1	1	0	1	1,381	1
E. and W. Lennoxton ...	2	4	10	3	24	28	1	0	7	1,316	0
Natal Steam ...	1	7	8	2	66	1	1	7	8	1,149	18
Ramsay ...	6	36	17	3	77	32	4	18	14	1,087	14
Crown ...	3	32	44	2	62	11				854	0
Natal Merthyr ...	4	101	2	2	43	6				735	10
Central ...	4	32	2	1	57	2				618	13
South African ...	4	10	0	3	47	1	4	21	5	400	10
Natal Victoria Navigation	4	17	1	2	27	...	2	15	0	312	10
Total ...	119	561	673	91	1,560	900	31	157	95	48,330	16
Corresponding month, '02	98	438	476	73	1,304	949	4	0	124	52,317	17

CHAS. J. GRAY, Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of January, 1903 :—

	tons.	cwt.
Bunker Coal ...	14,346	16
Exported to :—		
Cape Colony ...	1,659	19
Beira ...	20	0
All Colonial Coal ...	16,026	15

Custom House, Port Natal,
February 2nd, 1903.

(Signed) GEO. MAYSTON,
Collector of Customs.

The Northern Star Potato.

THE possibility of buying a 1,000-acre estate from the profit of one year's cropping on an acre of land would seem so improbable at first sight that no one would credit it. But there has been that possibility this year. A new variety of potato—the Northern Star—was put on the American market last year at 10s. per lb., or £1,120 per ton. There is no record of any variety approaching this high price. The Northern Star is on the market at 5s. per lb. this year, and there is no doubt from the great powers

of resisting disease which it has shown this year, it will remain at a high price for some years. The possibility of producing £8,000 per acre is illustrated by results obtained at the Colonial College, Hollesley Bay. Four pounds of Northern Star were cut into 168 sets, an average of forty-two sets to the pound. Each eye, with a small piece of tuber attaching, was planted in a separate pot, and when the young plant was established it was transplanted into good garden ground. Although still green through having re-

sisted the disease, the plants average 3 lb. of tubers at each root. Each plant occupies four square feet. There are 43,560 square feet in an acre, consequently 10,890 plants are required per acre. As each plant averages 3 lb., the yield per acre is 32,670 lb., which, at 5s. per lb., gives £8,167 per acre. The outlay for seed is heavy at 10s. per lb., as with 10,890 sets, and forty-two sets to the pound, 260 lb., costing £130, are re-

quired. The expenses of working would be about £30, consequently a clear profit of £8,000 is shown per acre. A market for the produce is found among farmers, who have made large profits on new varieties. Also gentlemen's gardeners and amateurs, who are always on the lookout to be up to date in their work for exhibition, as well as for utility purposes. —*Queenslander.*

Correspondence.

PASPALUM DILATATUM.

To the Editor Agricultural Journal.

"Faldon," Fawn Lees P.O.,
February 8th, 1903.

DEAR SIR,—Some months ago I promised to let you have further reports on my *Paspalum dilatatum*. I am more pleased than ever with the grass. It has stood this most awful drought that we have just passed through admirably, and I feel perfectly convinced that the planting of paddocks from five acres up to 100 or so (in all parts of Natal) would prove one of the finest investments that could be gone in for by our farmers at the present time. Paddocks of this grass near homesteads for horses, milk cows, and trek oxen are simply invaluable. Trek oxen when outspanned during the afternoon fill themselves in a remarkably short time and then lie down to rest, instead of wandering miles away in search of succulent food. Whenever they are wanted, either early in the morning or late in the evening, they are always at hand.

If the land is well treated, 100 head of cattle could be grazed where otherwise a dozen or so could only barely eke out an existence. Those who have seen this grass growing well will know that this is by no means an exaggeration, and is probably much under the mark. My advice to those who intend going in for this grass is to spare no expense in manuring and to obtain a fine tilth. The planting out of a paddock (whichever way it is done) is an expensive operation, and therefore I

consider it undoubtedly to be the best economy to devote one's attention to ground that has been well prepared and manured.

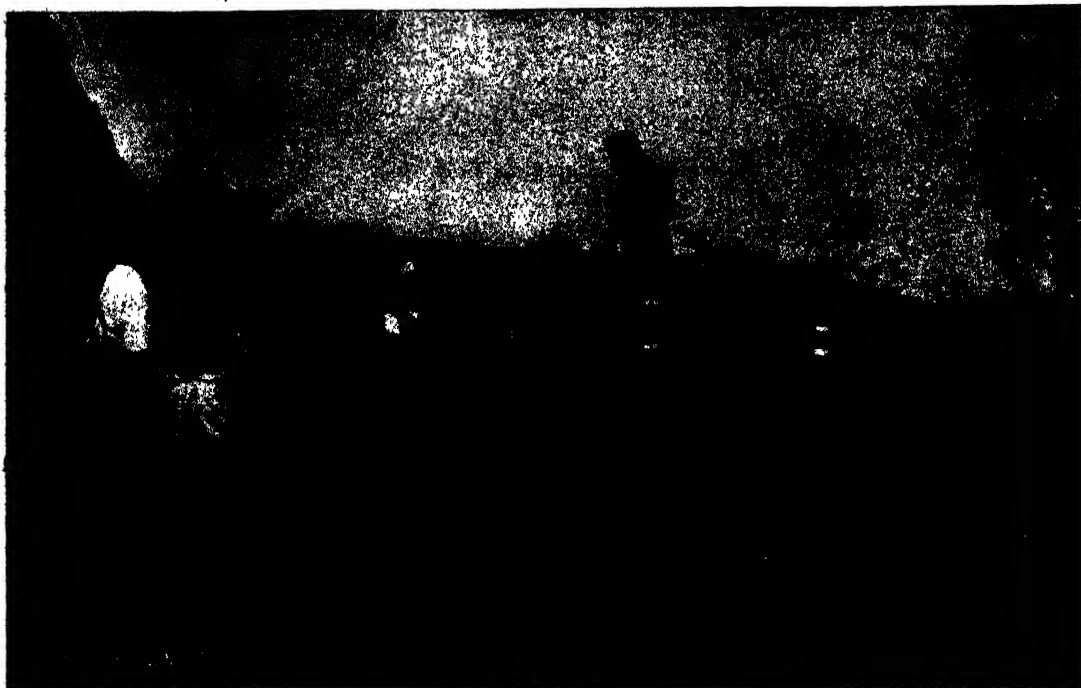
However, I believe I am correct in saying that it would pay to grow it on almost any soil; even the poorest of the poor; but I certainly think that too much attention can hardly be given to the first plots. Last March I planted a small paddock of about four acres, and it has almost been invaluable to me already. Although only in small tufts about three feet apart each way, it gave good grazing for about eighteen calves very early in the spring (before any other grasses had shown a sign of coming on). The mothers of these calves also grazed in this paddock at night for weeks at a time. Later on I bought three thin cattle and put them in this paddock, with the result that they were fat in less than a month, and I sold them at about 50 per cent. profit. Later on in the season again I had 16 scuffling oxen, 18 cows and calves all grazing in this paddock at night time. It was several weeks before they ate clean down.

The calves, of course, ran in the paddock all day. Perhaps I ought to explain that in between these dates the paddock had very little stock running in it, except a few donkeys and a couple of horses for a day or so at a time. My calves, however, got so fat that I had to put them into another paddock with less succulent grass in it. When I planted

Fruit-Growing in the Midlands.

A CHAT WITH MR. FRED. SYMONS.

By "ERGATES."

**GLENBELLA : WHITE LABOUR ONLY.**

IN reply to a letter asking if I might give a description of his fruit-growing work, Mr. Fred. Symons, the well-known orchardist, said that I should be perfectly welcome to do so, but that, with the exception of three white men, he was quite without labour. The conditions of carrying on orchard work with practically no labour appeared to me so singular that I thought some special interest might characterise an interview with a fruit-grower so unhappily situated. In the United Kingdom, if I am not mistaken, the King's Regulations permit the engaging of soldiers for harvesting. During the present dearth of labour this question may be worth enquiring into by those interested.

Glenbella—the name of the farm—is situated two miles from Willow Grange :

some five miles on the Maritzburg side of Estcourt. It is well sheltered from the south and west, and has a north-easterly aspect. Its altitude is about 4,500 feet. The soil, which is deep, is dark red in colour, and, although light in texture, is not sandy. Mr. Symons is the pioneer of the fruit industry in the Midlands. Here and there were small orchards, large enough for the wants of the homestead, and occasionally to spare, but there were none on a scale to be of first importance to the farmer.

"What made you go in for fruit culture?" I asked.

"I suppose the idea came from my father. (The late Mr. J. P. Symons was for many years the Auditor-General of the Colony, and later M.L.C. for Umvoti). My father took

great interest in country life, and in budding and grafting and in everything connected with trees he was a keen enthusiast. Then, again, the closeness of the railway, which was then laid out though not constructed when I came to the farm in 1880, suggested that the facilities for marketing fruit would be good."

"You started then with no special knowledge?"

"None. I had to feel my way as I went. Many hundreds and hundreds of trees were planted and carefully cultivated for years, and have proved absolute failures. The present results, such as they are, are from my own, and often dearly-bought, experience. Of late years orchard planting is much easier owing to the information which comes from countries having climates and conditions more or less similar to our own. The American catalogues, now easily obtainable, tell much that I had to pick up. Mr. Wm. Woods, who then lived at Stockton close by, and had an excellent orchard, gave me a good deal of information about orchard work in England, and from him I got several stocks which are still among the best I now have. My brother John Symons, of Claridge, and I were the first in the Colony to import from America. We imported through the late Mr. John Ireland. The venture was a success, and, becoming known, others followed our example."

"The beginning was uphill work then?"

"It was indeed. Fortunately for me I received continual encouragement and timely help in my darkest days from Mr. James E. Methley, of Newstead, Balgowan, who, to prove his faith in the enterprise, lent me considerable sums of money to tide over my difficulties. Had it not been for his kindly interest in my work I should probably have been overcome by the innumerable obstacles which hampered the fruit industry for the first ten or twelve years."

[The well-known and greatly-respected old colonist, Mr. Methley, died on the 4th inst. at the age of 77.—Ed., *Agricultural Journal*.]

"How many acres have you under fruit trees?"

"About thirty."

"And you have all kinds?"

"Pretty well, and a good many varieties of the different kinds."

"In America, orchardists appear to limit varieties as much as possible. Would it not pay you better to keep to just a few standard kinds?"

"No; American conditions are different. Limitations in variety are suitable for growers on a colossal scale who supply an immense market, but for growers here, with small markets, a considerable variety, in my opinion, pays the best."

"Which markets do you principally supply?"

"Durban chiefly. I like the way they do their business the best. Maritzburg I do not find so satisfactory, and in consequence do not send much to that market. In the matter of sampling Durban is much the preferable. Your boxes are in piles, say 7 or 8 deep, and the top only is opened. Of course, according to the attractiveness of the fruit so it disappears. But the lower boxes are intact. In Maritzburg all the boxes are opened, and the loss from samplers, genuine and otherwise, is immense. A grower finds much interest in seeing a motley crowd going through—his pears, shall I say?—each worth sixpence apiece. I don't send to Johannesburg because the empties are not sent back."

"What are your kinds of fruit?"

"Plums, apricots, pears, apples, nectarines, peaches, grapes, walnuts."

"Will you give me some information about them that would be useful to the readers of the *Journal*?"

"Willingly. I'll answer anything you ask."

The following was the result of my series of questions:—

PLUMS.

"The earliest is the Mirabelle, or the Christmas plum. The fruit is small, but the crop is big. They ripen here at the end of November. Apricots about Christmas. The Orleans is one of the best plums. It is a large purple one,

and on the market it is popular both for eating and cooking. It ripens here at the end of December. The Early Greengage comes on at the same time. A little later the Standard of England is fit to gather; it is a grand plum, large and purple. Ordinary Greengage Damsons follow, then comes the Egg plum, and in March the true Damson ripens. Of Japanese plums I have six varieties. All are hardy and prolific. The Hatankio is a heavy bearer and sells well; it is yellow and heart shaped. The Burbank and the Satsuma are the heaviest bearers."

PEARS.

"The pears begin in January with the Jargonelle, then the Saffron, then Williams' Bon Chretien, and then what I call Late March. In April I have still another two to follow, but I am sorry I cannot give the names."

APPLES.

"In apples I find the Common Dutch, American Lady, Fill-basket, the most suitable. All bear well, and the fruit sells well."

APRICOTS.

"Of apricots I find the Moorpark the best."

NECTARINES.

"In nectarines I have six varieties. The White is the most saleable. I have had 15s. a case of 120. The Yellow clingstone is a good marketable fruit. This originated from a peach stone—the St. Helena, or Zwart Gert, as it is called. You know the nectarine is only a peach freak. The Scarlet loose-stone is a good bearer, and sells well. The common red variety is good as to size, but the crop is only medium. It also sells well."

PEACHES, ETC.

"Of peaches I find the two best are the Royal George, and the Madame Lotter, which originated in this neighbourhood."

"In grapes I find the Hannepoot, both white and purple, the most profitable. The Catawba and the Little Sweetwater are good, and do well in the open."

"I have also quinces, figs, and walnuts, but I don't do much in them."

FRUIT NAMES.

Here Mr. Symons turned to the subject of names for fruit. He said he thought there was plenty of confusion on the subject in every country, but here in Natal the nomenclature was in a perfect maze. Fruit-growers and consumers using the same name would mean distinctly different kinds of fruit. This applies all along the line—apples, pears, peaches, oranges, grapes, and the whole lot. In connection with this question, Mr. Symons related the following:—While Buller was at Frere all the foreign *attachés* accompanying his Army Corps rode over from Estcourt to visit his place. On the Japanese officer being shown a fine specimen of the Satsuma plum tree he expressed great delight, but, on Mr. Symons calling it by the name Satsuma, he said, "No; this is the Seemomo. Satsuma is simply the name of a large district in Japan, and in no way identifies the plum."

NATAL FRUIT-GROWERS' UNION.

"Is not this," I asked, "a question for the Natal Fruit-growers' Union to take up?"

"It is, I think, but, as a matter of fact, the Union at present has all it can do with the commercial side of fruit-growing—railway and marketing grievances, etc. The Union is chiefly composed of Coast growers, but all Up-country growers should join it."

HAILSTORMS.

"And hailstorms?"

"I am pretty lucky. I have not had a really bad one since the fourth year from starting. That storm cut down nearly every tree."

PRUNING.

"And about pruning?"

"I don't prune. The matter is a debateable one; and, balancing all for and against, I let my trees take their natural growth. The climate here is dry, and the trees do not make anything like the wood which those nearer the Coast do."

LABOUR.

As may be supposed, the question of labour frequently cropped up. To be

losing tons and tons of valuable fruit owing to want of labour must be trying to the temper, but Mr. Symons, I cannot refrain from saying, spoke of the situation with exemplary calmness and good humour. Asking how the fix came, he relied to the following effect :—

“I bought from the Land Colonization Company a farm in the Weenen Thorns for labour. The Kafirs objected to the usual conditions of work, but agreed to pay £3 per hut rent, and come out when wanted for sheep shearing, cattle branding, and fruit picking at 1s. a day. After giving these terms a month's consideration, they individually signed last June a deed to that effect. The deed of agreement was formally drawn, properly interpreted and explained, and signed before a J.P. For the sheep shearing none turned out, and indeed since then I have had any amount of inconvenience and loss. From that time I have been trying by law to get the Natives to fulfil their contract. So far I have made no progress, my only gain being in experience in the procedure of Magistrates' Courts and acquiring knowledge of the working of the Masters and Servants Law. On having the men up for the first time, the Magistrate fined them £1 each, and ordered them to go to work and fulfil their contract under threat of double fine or three months' imprisonment. This was the result. Out of the fifteen two put in an appearance. These two boys on arriving apologised for their behaviour, saying that they had been carried away by the words of the others. After a day or two they asked me why I did not get the others out. The question was a poser. The rest were summoned to appear before the Magistrate, but only four did so, and, as far as I know, nothing was done to any of them. The Magisterial command was being ignored by them, and all that I could do was to say that I should sue the delinquents for damages. The two boys began quickly to realise that my position was weak, and on the tenth day they were missing. Getting no relief under the Masters and Servants Act, I went in for a try of civil law, and accordingly I sued each of them for £6

damages. One paid up voluntarily, and the case, coming before the Magistrate of their district, one—or perhaps two—were ordered to pay the sum claimed, namely, £6, one, for some reason I have not yet succeeded in understanding, was entirely exonerated from the payment of damages, and the balance were called upon to pay £4. It is all very curious.”

The damages, if they don't go far, will at any rate give some compensation ? ”

“Yes, if the lawyers do not absorb them all. But here another joke comes in. The boys have appealed against the verdicts, and as to getting their labour I am just where I was at the beginning. They are, I suppose, thoroughly enjoying the litigation, and, being well off, have no need to work ; I, on the other hand, am suffering much loss from the breach of contract, and, in addition, have the petty irritations of absences from my place where my presence is much needed, long rides, and travelling expenses.”

“What labour have you now ? ”

“All told, I have three white men, my two youngsters home for the holidays, and one Kafir who lives on this farm. One of the white men is in the kitchen to help in the cooking. To-morrow I am getting three volunteer Kafirs, which will help a lot.”

PACKING.

The packing is done in a big thatched shed on poles increased in breadth by iron roofing. Here are great stacks of boxes ready for packing. At first Mr. Symons used any size and sort of boxes, but now all are of two uniform sizes. The cases are made on the spot. The ends are of plank from packing cases, and the top, sides, and bottom are of cement barrel staves. For the full size the staves are cut as the grooves—about a couple of inches from each end, and for the half sizes the staves are cut across the middle. The sawing is done by a hand power circular saw. The ends of the boxes have attached small pieces of wood about three inches by one to serve as handles. The cases thus produced, although not attractive in appearance, are easily handled, strong, and excellently adapted for ventilation. Each case, when complete, works out at a cost of about 2s. 6d.

LOSSES IN BOXES.

Mr. Symons incidentally said he only wished he could get cases at the rate mentioned in the article on the "Collect on Delivery" system. Last year, he said, he lost nearly 700 owing to non-returning. The smashing of boxes on the railway, irrespective of the loss of fruit, some through wanton carelessness, and others for the purpose of getting at the contents, was enormous. After a bout of useless correspondence, he took samples of the wrecks to the General Manager's office at Durban, and since then there has been a very great improvement in this respect. The ways of opening the cases by purchasers afford a certain amount of amusement and annoyance. The cases are locked with a piece of wire running through a wire staple on the lid and another on the side. All that is required for opening the case is to untwist the wire. Instead of doing so, many knock off the bottom or top staves, and others, instead of untwisting or cutting the one locking wire, cut through both of the hinges. Mr. Symons has supplied wire pliers to the Durban Marketmaster for general convenience.

Every case has its number, and when sent out the kind of fruit and quantity packed in it is given on a label.

LOSSES IN FRUIT.

The loss in fruit until actually sold is great. In the orchard, of course, it pays heavy toll, and a discriminating taste for the best is always quickly acquired by the pickers. Then there are the mysterious leakages on the railway, and at the market the amount of sampling by people having no intention to buy is altogether inordinate. By way of confirmation, Mr. Symons handed me the following letter which had just appeared in the *Mercury* :—

"Sir,—Pilfering goes on at the morning fruit market. On Wednesday morning, what was my surprise, as soon as a box of fruit was opened for inspection, to see at least three or four dirty hands thrust in, and a couple or so of apples, peaches, or a bunch of grapes dragged out, in order to sample their quality. This was under the very nose of the Market-

master and his subordinates. The box of pines I had selected was a dozen short by the time it was knocked down to me. This vile practice is hard upon those purchasers who stand outside the ring, and do not see what is going on. They bid so much for a box of fruit, thinking to get it intact from the growers, instead of which it is half empty by the time the buyer takes possession.—I am, etc.,
DISGUSTED."

While at the shed a light spring trolley specially made was being loaded. Before leaving the shed the number of the case and the particulars of the fruit are entered in a register. On referring to the pages of this book for the corresponding time of the last year, I saw that only a third or fourth of the then business is now being done. The crop being on an average as good, the only inference is that the difference in quantity is rotting on the ground.

Agricultural Shows.

Himeville, Friday, 3rd April. Entries close 16th March; late entries 2nd April. Henry C. Gold, Hon. Secretary.

Greytown, Thursday, 14th May. Entries close 25th April. W. H. Gibbs, Hon. Secretary.

Estcourt, 3rd and 4th June, 1903. E. Catherley, Hon. Secretary.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries close 4th June; late entries 11th June. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Noodsberg Road, 6th August. Entries close 25th July. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

MEETINGS OF AGRICULTURAL SOCIETIES.

Klip River, at Town Hall, Ladysmith, 28th February, at 10 a.m.

Three hundred years ago shepherds were "wont to bridle and correct the heat and fury of a ram that is too heady and disposed to fight" by binding upon his head a good strong board, into which had been driven a number of nails, whose points protruded on the side which was placed against the pugnacious ram's head. This appliance made butting painful to the aggressor.

Coast Fruit Culture.

SOME HORTICULTURAL NOTES.

THE following is the substance of a lecture upon the above subject, delivered by the Government Entomologist at the monthly meeting of the Lower Tugela Division Association, at Stanger, on 11th February:—"It is well to point out that the commercial prospects of the coast fruit industry are to a certain extent limited, not only by the varieties which can be produced, but also by its relation to the market. It may be stated that the market for Natal coast fruits is confined to seven towns—Durban, Maritzburg, Johannesburg, Pretoria, East London, Port Elizabeth, Capetown, and Kimberley. I have not forgotten the trade with the Diamond Fields, but this may be considered as part of that with East London. All these centres are bound to become larger, and, therefore, greater consumers of fruit; but it must be remembered that, as regards the Cape markets, the two principal demands—for oranges and pineapples—are bound to fall off with the greater productiveness of the Eastern Province of the Old Colony, in which both fruits are being extensively planted. In time, therefore, it is extremely probable that the demand for Natal coast fruits will there become limited to that early supply, which, through the favourable circumstances of climate, you will be able to meet. Looking towards the Transvaal, the prospects may be regarded as brighter, but it must be remembered that there are parts of that Colony where the two fruits I have mentioned can also be produced. The local demand may be looked upon as good for a considerable time to come, but it, too, must reach a limit. Should fruit culture be gone in for extensively, it therefore becomes evident that we must look for some over-sea trade, and, whilst we shall be late in the day, still, there is no reason why, with good shipping facilities, our fruit should not be placed upon the European market. Summed up roughly, the outlook for the industry is bright, but I am not optimistic enough to say that it is brilliant. Speaking generally, I believe I am correct in saying that the growing of most fruits pays very well throughout the whole Colony—at any rate, the prices gained by the grower are higher than those obtained in most other parts of the world, and they are gained with cheaper labour, and with less attention to cultivation and improvement. This is not to say that every fruit will pay handsomely, for its growing, any more than it pays to grow a tennis lawn; but the returns to those who do go in for fruit culture, if never running to a fortune, will provide a much better competency and greater luxury than ever they would if conducted on the same scale, and in the same manner in, say,

Australasia or America. In the variety of payable fruits it is not yet possible to say to what this coast is limited, as no doubt there are several fruits which may yet be found suited to the climatic conditions, and when you have your experimental farm no doubt an effort will be made to discover these. For practical purposes, a list of such may for the present comprise the following, pretty much in the order of their importance: Citrus fruits (oranges, mandarins, and lemons), pine-apples, bananas, mangoes, avocado pears, paw-paws, liches, and a small group of peaches.

All citrus trees do remarkably well upon the coast, particularly when sufficient care has been taken to choose a fairly sheltered site and a porous, well-drained soil. Of well drained soils we have plenty, and several varieties, and there is little excuse for selecting the unsuitable. In the matter of site, I often think there is too great a tendency to select it where the ground slopes too rapidly for proper cultivation, and often, too, sites are over-exposed, instead of being sheltered from high winds. Personally, I should prefer a gently-sloping site, with a good depth of soil, into which the roots can penetrate and secure a supply of moisture during the dry seasons, and with a somewhat southerly aspect rather than a northerly one. I would disparage deep planting and the digging of deep holes, preferring a better preparation of the whole area intended for planting, by sub-soiling and good cultivation, before the trees are put in, a remark which applies equally to the growing of any of the fruits I have mentioned. As to the selection of varieties, I need only remark that, whilst we have some good kinds, still there is ample room for improvement in the general class of citrus fruits produced. There is a number of good varieties of oranges, mandarins, and lemons, which I am sure are worth trying, and to which attention should be given.

A point of importance which it is still necessary to discuss is what to plant—seedlings or worked trees? By worked trees I mean either budded or grafted trees, and it is necessary to discuss the question, because of the great local prejudice which exists against the worked, or, as it has been commonly called, the grafted tree. Such prejudice is practically limited to the grafted orange, because worked mandarins and lemons are not particularly well known. I have naturally been at some pains to solve this riddle, and to that end have made a number of enquiries. My earliest experience taught me two things—one, that the man in the street knew all about it, and grafted trees were an abomination—that was his verdict, and, as he had probably never grown an orange tree, of

course, he could speak with a positive assertiveness not uncommon to his class. Then there were others whose objection culminated in the "fact" that the orange, being grafted on to lemon roots (as they generally are in Natal) must necessarily be sour. There is a large number who believe this, but it is never so, for the lemon stock does not transmit its properties to the graft, and if a sour orange be produced upon a worked tree the only conclusion is that the graft was taken from a tree bearing sour fruit. Then, again, there are others who object to the grafted tree because it invariably turned to a lemon, and only bore a few oranges on one or two limbs. I have fortunately had several opportunities of examining these eccentric plants, and in every instance have found that suckers from the lemon stock have been allowed to grow up, and, being of a vigorous nature, have quickly supplanted the orange scion. Putting all prejudice aside, it may be stated broadly—(1) That the grafted tree has not been sufficiently long before the grower to say that it is so short-lived in comparison to the seedling; (2) that the grafted tree is always purchased from the nurseryman, and up till recently (before the practice of fumigating came into operation) such trees were often received infested with scale insects, which were overlooked until they had crippled the tree; and (3) that budding is preferable to grafting.

So far as the seedling is concerned, I only need mention its disadvantages, which apply to all fruit trees, quite as well as to the citrus family. These are two: Firstly, the length of time they take to come into bearing; and, secondly, and more important, the uncertainty as to the quality of the fruit and the bearing capacity of the individual trees. The budding or grafting of trees originated in the desire of the horticulturist to produce, in quantity, trees which would come early into fruiting, and which would bear in quantity a type of fruit of a standard quality. Owing to the proximity in which fruit trees are grown, and the various agencies and conditions controlling the fertilisation of the female organs, the progeny of an individual tree may produce a number of varieties. Therefore, a seedling may prove to be anything, from something excellent to something quite undesirable. It is the province of the horticulturist, by the aid of his various arts, such as artificial cross fertilisation and selection, to improve fruit, and produce from seeds plants with the most desirable features. The production of a good sort may often be a matter of chance, as well as design; but, owing to the probability of its deteriorating when repeatedly reproduced from seed, having once secured something desirable, he is compelled to resort to artificial means of working it on to the roots of such as he can readily produce in quantity. Apart from this, he secures the further advantage that, if the scions (buds or grafts) are taken from a fruit-

producing tree, his worked tree will rapidly become productive. It is thus seen that the working of trees has its origin in sound economic principles, and we may say there is no good reason for the prejudice which exists against the worked tree, and that because of that prejudice intending planters should confine themselves to seedlings.

An important feature in the cultivation of citrus fruits, more honoured in the breach than in observance, is pruning. Many assert that no citrus tree requires either pruning or shaping; their dictum is, never put the knife into the orange, the mandarin, or the lemon. My advice is, put in both the knife and the saw, but intelligently. The laws of pruning are not arbitrary, for not only does each kind of tree require a different style of pruning, but each tree has its individuality, no matter what sort; and to that individuality attention must be given, and its requirements studied upon the spot. There are two phases of pruning for every tree—one in bringing it into shape, and the other in maintaining the balance, i.e., the balance of its growth, so that one limb does not grow to the disadvantage of another, and that leaves are not produced out of proportion to fruit, or *vice versa*. The first phase commences with the setting out of the tree in its permanent place, for, as it comes from the nursery, it is seldom exactly right for letting alone. It is often advisable, in setting out the young tree, to reduce the top growth to balance it with the roots, which are often injured in transplanting, and in paying attention to this it is also necessary to trim with a sharp knife any broken roots, in order that they may heal quickly, and because a broken root may readily become the seat of decay, which later will spread itself to the tree, weaken its vitality, and directly or indirectly cause its death. One thing to look to also is to provide a nice clean barrel or trunk 18 in. or 2 ft. in length, removing always any lateral limbs which have formed below 18 in. Exception is sometimes taken to this practice, because the bark may be exposed to the hot rays of the sun. That can, however, be easily avoided by covering the stem loosely with a wrapper of straw until the shoots make sufficient growth to shade it. Attention must also be given to the trend of growth exhibited by the transplant, and the opportunity taken to remove such branches as upset the balance of the head, and an effort made to secure lateral limbs well set upon the trunk, for such in time become the main framework of the tree. The first phase of pruning is directed for several reasons to the formation of a well-balanced, compact head. The second phase differs somewhat in the case of the orange and the lemon, because each produces its fruits differently. An orange tree, well started, has a natural tendency to grow in the right direction. Attention must be given when it is young to any crossing branches, and, where one overbears another, that

whose direction is the less desirable should be removed. During the early life of the tree, it is well to keep the centre somewhat open, and to check that tendency of producing numerous upright branches in the centre of the tree. Fear that the tree may become too open need not be held too greatly, for the same tendency will make the top close up. The fruit of the orange is produced upon the outside of the tree, and is born upon the terminals of the new season's growth, and it is only when these have room to mature that the trees bear even crops. Often the foliage of the orange becomes too dense, and many terminals are produced—so many that they crowd one another out, and as a result the tree bears unevenly—one year producing a large crop, and the next but little. This is consequent upon Nature's own pruning, but, curiously enough, this is not done well, and by judiciously thinning the terminals of a bearing tree better and more even crops can be obtained. More striking evidences of this are perhaps found in the case of the mandarins, which locally get quite into the habit of producing crops only in alternate years. The lemon tree receives similar treatment to the orange in its early growth, but after the first couple of years it requires more attention, owing to its vigour and characteristic rank growth. The greatest care has to be taken to prevent the heart of the tree filling up with long perpendicular water shoots, which later on are apt to become an objectional feature. Moreover, upright growing stems are not fruit-producers, and so the knife must be used to the tree, to encourage and ensure the growth of lateral limbs radiating from the central permanent parts of the tree. The lemon differs from the orange essentially in so much that it bears its best fruit on side branches, inside the body of the tree. The key to the pruning of the lemon will be found in the suppressing of the vertical growths, and encouraging the horizontal, not alone in keeping the centre of the tree open, but also in pruning upright growths on horizontal branches as well. No crowding, tangling, or crossing of limbs should be permitted to exist, and when lateral limbs grow out and hang down too much with the weight of the fruit, they should always be shortened in. In this manner the lemon tree may be built up in irregular tiers of radiating limbs, for the centre of the tree will always supply the necessary branches to raise the top when required. Of the growing of other coast fruits it is not my intention to speak to-day. I have had no practical experience in their culture, and the time is not sufficient to enlarge upon the theories as worked out in other parts of the world. I believe thoroughly, however, that there is vast room for improvement in the cultivation of all coast fruits, and that in the culture of those which pay—as apart

from citrus fruits—much will have to be done if we are to command any outside markets. Many very bad bananas are grown, and more poor ones, and yet there are many excellent varieties. Attention should be particularly directed to well-coloured sorts, with good taste. The Natal fruit-eating public has for years been educating its taste down to small, ugly fruits, and the reply is that they have the best flavour. The best eating pineapple is a scraggy weed, the best banana is an ugly green thing, the best mango one whose rind is blackened with disease; but these best will not suit the people who are going to populate this and the other Colonies and buy our fruit. They know that there are even better eating and better looking and bigger, sorts than these we show them.

In my opening remarks I mentioned the existence of a small group of peaches suitable to the coast culture. I am fully aware that several sorts do very well, and are only failures on account of insect attack. In this, however, the owner of the tree has only himself to thank. If he will train a low-headed fruit-producing tree, and cover it with netting, which is specially imported for the purpose, he will have no complaint to make about either moth or maggot. And here upon the coast, where early peaches are so desirable and so expensive, where every decent peach put into one's mouth means the swallowing of a couple of pennies, it will always pay to net the trees. The group of peaches which I wish to mention is not well known in Natal, and it is only quite recently that I have seen a few, and those of an inferior class. The group is known as the Peen-to, and more commonly as the flat-button peaches of China. The characteristic feature of the group, as I knew it in Australia, and one which it retains in its improved varieties, is the earliness with which it ripens. Where I knew it this was the most valuable trait in its character, for it invariably ripened and escaped the attacks of moths and maggots. The Peen-to group is essentially adapted to sub-tropical conditions, and, as Florida is credited with giving it to the world, they may be regarded as peculiarly Florida peaches. These peaches were first grown in England in 1820, and nine years later in America. These original introductions were, however, lost, and it was not until forty years later that the peach was again grown, and then from seed obtained in Australia. From these seeds, trees were raised, and, I believe, some twenty-two varieties obtained. Many of these have since disappeared from cultivation, and now only about ten varieties are grown. These varieties are suitable to various parts of Florida and the sub-tropical regions of Texas, Louisiana, Mississippi, and Alabama. Some of the varieties are local in their adaptation, but others succeed over large areas and under

different conditions. This being the case, one is certainly justified in hoping for several suitable to coast culture in Natal.

These notes, coming from me would, I suppose, be incomplete if I made no reference to the various blights which affect coast-growing fruits. The list of pests is not a very long one, I am glad to say; still, it contains some very capable members. Locusts, I think, I may leave out of consideration for the present; you know them quite as well as I do, and you are also fully aware that, as long as they continue to migrate into the Colony, they are a menace to many things, though, fortunately, less to fruit and tea than to sugar-cane. You are also perhaps acquainted with the work of destruction which I am endeavouring to initiate this season. This consists in destroying wingless swarms in locations and on Crown lands, and in compelling private owners to destroy such as are on their lands. We are doing a lot of good work from Durban down to the Umzimkulu, and in that district there are five or six Europeans supervising the killing of hoppers in the Native locations. In enforcing the Act, we have so far met with no serious opposition, and many parties who never before destroyed locusts upon their estates are now doing so. No prosecutions have as yet been necessary, our opponents having yielded to threats and common sense arguments. The first year's work may not be altogether satisfactory, but it must be remembered that it is only a beginning, and further that, whilst it is being done in response to the agitation of coast farmers and planters, and in their interest, with half-a-dozen solitary exceptions, no help has been given, even the little of reporting the passing of swarms, and the laying and hatching of eggs. This apathy, if tending to minimise the results obtained, will, at any rate, silence criticism, for how can one criticise after evading the law?

The chief pests of citrus trees are four. The mussel scale and the purple scale, collar-rot, and the *Psylla* aphid. The latter pest is the least noxious, and other than causing considerable disfigurement does no permanent injury. Upon young trees the sappy water shoots are frequently much distorted, and it is a very good plan to pick off infested tips. Much good can also be accomplished by spraying with paraffin emulsion. Of the two scale insects the mussel scale is the most destructive, and is very often the cause of much mischief and loss. There are two forms of treatment to which it yields: these are spraying with either paraffin emulsion or with resin-wash, and fumigating with hydrocyanic acid gas. Both are troublesome, and the latter expensive; but with young trees, or productive trees, such treatment will be found to pay. As a rule, however, the fruit-grower has other irons in the fire, and in these cases the time and expense and worry of the work are so great that it is generally neglected, more particularly as it necessitates a great

deal of personal attention, and, where the infestation is great, much repetition. Both these pests are introductions from abroad, and until recently were commonly spread about upon nursery stock. This is now less, owing to the growing practice of fumigating stock before delivery by nurserymen. If trees are clean when planted, and there is no immediate source of infection, they will often keep clean for very many years; indeed, I know of whole orchards which have done so, and, therefore, it behoves everyone in purchasing young citrus trees to ask for a guarantee of freedom from scale with them, and, in any case, to insist in having them fumigated before delivery. The most serious disease of citrus trees is that known as collar-rot, or root-rot. This sets in among the roots, and becomes manifest by a decaying of the bark at the base of the tree above the ground. Once a tree is attacked it becomes a hopeless case, and will ultimately succumb to the rot. Some, particularly old trees, which manifest the disease late in life, live for many years, whilst younger trees will die suddenly. Collar-rot, so far as I can now make out, may have its origin from several causes, and the best recognised of these is bad drainage. Well-drained trees often suffer severely, and in these cases I believe the trouble originates with some injury to the roots. The disease is usually regarded as a fungus, and in the case of bad drainage it would attack a tree through the decaying roots, and where roots are injured, either in transplanting, or later on in cultivation, there it may also gain an entrance. When it has made its appearance, a tree may be kept in vigour by heading back and manuring for a time, but directly it becomes profitless it is best removed and replaced by a fresh tree, care being taken, of course, to open out the soil and remove decaying roots, to allow the soil to sweeten by exposure to the atmosphere. The banana has no serious pest at present, whilst the pineapple has but three of any particular moment. One of these may be passed over lightly, as it is nothing more than unsightly. This is the mealie bug. Another, the white scale, is avoided best by planting clean suckers. This attacks the leaves, and, when allowed to make headway, often blasts them badly. Clean suckers should be secured by selection, and when they are difficult to obtain, infected ones should be dipped in paraffin emulsion before planting. The third disease is a fungus, which attacks the fruitlets. Its exact cause is unknown, but is believed to be an indication of deterioration.

From 2 lbs. of Northern Star potatoes a yield of 8 stone has been produced, says a Lincolnshire correspondent of *The Farmer*. "My neighbours beat that," he adds. One has 6½ stone from 1 lb., another 10 stone from 2 lbs. They are now selling at 10s. per lb.

Veterinary Departmental Report for January, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of January, 1903 :—

There has been a considerable falling off of contagious disease in the Colony during the month, with the exception of Glanders.

Scab.—Three fresh outbreaks of this disease only have occurred, all in Weenen County.

Lungsickness.—Seven fresh outbreaks have occurred during the month—3 in Ladysmith, 3 in Newcastle, and 1 in Weenen County.

Rinderpest.—Two fresh outbreaks only occurred in Natal during the month, and both of these were in the Krantzkop Rinderpest area. Infection in these cases came from Zululand.

In Zululand the disease is still prevalent in many districts, but during the month a reduction in the number of deaths and fresh outbreaks has taken place, particularly towards the latter end of the month. The Eshowe District is still badly affected. Much difficulty is experienced in the inoculation of Natives' cattle, the majority now refusing to inoculate. Some 500 head of Natives' cattle died during the month from Rinderpest in Zululand.

Redwater.—This disease has been prevalent in the Ixopo and Ladysmith Districts, and cases have occurred generally throughout the Colony, particularly amongst calves.

Anthrax.—Only one case of this disease has been reported during the month. This occurred on the Pietermaritzburg Town Lands.

Glanders.—This disease is very prevalent in and around Durban. 31 clinical cases and 19 animals reacting to the Mallein test have been destroyed in Durban during the month. One clinical case in Ladysmith, one clinical case and two reacting cases in Umgeni District, three clinical cases in Newcastle Division, one clinical case in Umvoti, and three in Victoria County have been destroyed during the month.

Horsesickness.—This disease has become prevalent during the past few weeks. 12 cases have occurred in Ladysmith and Upper Tugela Districts, two in Pietermaritzburg, seven in Durban, one in Umvoti, and one in Lion's River Division.

The Utrecht and Vryheid Districts have now become portion of Natal, and in consequence of this, cattle from those Districts may now cross the Buffalo into Klip River County. The Stock Laws of Natal are now in force in these Districts.

With the exception of Rinderpest, along the Valley of the Pongola, below and around the junction with the Pivaan River, and a few isolated cases of Lungsickness, disease in stock is not very prevalent in these Districts.

When the Stock Inspectors for the new Districts take up their duties more detailed information will be furnished.

S. B. WOOLLATT,
P.V. Surgeon.

ESHOWE.—D.V.S. TYLER.

Rinderpest.—During the past month the progress of Rinderpest has been marked by a decline in some districts, and in others by some amount of increase. The decline has been most marked in the Mahlabatini District, where I am hoping the disease will shortly be under control. There have been a number of fresh outbreaks in the Ndwandwe District, and renewal also in Nkandhla. In Eshowe District we have had outbreaks in directions where the disease had existed previously, but had been stamped out. Up to the present, however, these latter cases have been prevented from spreading, and I think we may anticipate overcoming them at an early date, though the attainment of this end is greatly handicapped by the reluctance of the Natives to inoculate for the third time. The system of employing Natives as inoculators, in lieu of Europeans, is being put into operation as speedily as possible, but the process is necessarily somewhat gradual, as one has to use great care in selecting suitable men. All the Natives are under the

direct control of a European, who is responsible for the carrying out of the Regulations in his District, and only the actual inoculation is done by the Natives. Serum is also being used in some districts in infected troops, and cattle for this purpose will shortly be sent to all centres of disease.

In the Eshowe District the disease exists pretty close to the river in a few places. The danger to Natal from this proximity is not so great whilst the river is high, but would be multiplied considerably should it dry sufficiently to allow of Natives crossing. The banks are being well guarded, and every precaution taken to prevent the possible carrying of meat, or other infective material, across. I intend, circumstances permitting, to personally visit every centre where Rinderpest exists in Zululand, starting next week.

LADYSMITH.—D.V.S. O'NEIL.

Rinderpest.—No fresh outbreaks have occurred during the month. The slowness of the progress of the disease amongst the quarantine herd on Modder Spruit farm, where the majority of the young animals succumbed, was notable. About ten or twelve head salted and the remaining thirty, which were inoculated with glycerinated bile, remained healthy. This outbreak has now died out, giving a clean bill of health regarding Rinderpest for this district.

Glanders.—A bad case of Farcy in a mule, the property of a Coolie was destroyed, and the usual precautions taken.

Redwater has been prevalent throughout the district. An imported Australian cow died in Ladysmith, which was progressing under treatment, but unfortunately was killed through bad drenching.

Gall-sickness carried off eight animals in the district, and four cases are reported to have recovered.

Horsesickness.—Five animals are reported to have died in the Upper Tugela division and about seven horses died in the Klip River division.

Lungsickness.—There have been three fresh outbreaks during the month amongst native cattle, and these were promptly dealt with.

Scab.—No fresh outbreaks occurred during the month, and only two flocks remain under license.

Blue Tongue.—One case was reported, but the sheep in the district are remarkably clean and healthy, and quite a number of sheep owners are removing their flocks to the Orange River Colony.

VRYHEID.—D.V.S. CROLE.

Rinderpest has been the chief contagious disease amongst stock. The chief centre is the Pongola Valley, and in it there are at present six outbreaks amongst cattle belonging to Natives. In former months the chief difficulty in coping with the disease lay in the fact that the owners of infected stock often failed to report the outbreaks, and refused to inoculate, and, further, that there was no proper legal machinery to prevent the movement of stock from infected areas. There is now, however, a better understanding with stock-owners, and large numbers of cattle in and beyond Ngotshi have lately been inoculated, so there is reason to hope that the disease will soon die down.

Lungsickness.—There have been some cases of lungsickness reported, and one herd has been quarantined. When Stock Inspectors are appointed here, no doubt many more cases will be discovered and dealt with.

Horsesickness is, of course, rife in certain notorious localities.

No diseases amongst sheep have yet been reported.

MARITZBURG.—D.V.S. FYRTH.

Scab.—There are no cases in the City or Umgeni Division, and there is only one flock under license in the Upper Umkomanzi Division.

Lungsickness.—No cases in any of the Divisions under my charge.

Glanders.—During the month I saw one clinical case of Glanders in the Umgeni Division which I destroyed. Two in-contact horses were tested, and both of these giving marked reactions to the Mallein test, were destroyed. No other cases have been brought to my notice.

Rinderpest.—There have been no cases of rinderpest in the Division.

General.—During the month I saw a herd of cattle affected with contagious ophthalmia, but these cases were amenable

to treatment, and no other cases have occurred. The treatment I adopted was as follows:—I washed all the stock (cows, calves, and bulls) well with a solution of Perchloride of Mercury 1:1000, all over the head and face, and then to those affected, I applied a lotion of Zinc Sulphate (10 grains to the ounce) to both eyes. In every case a cure quickly followed.

One case of horsesickness only has been brought to my notice this month in the Umgeni Division.

A few cases of gallsickness and quarter-evil have occurred in the Upper Umkomanzi Division.

One case of anthrax has been reported to me this month, but no further cases among the in-contact cattle have occurred.

MOOI RIVER.—D.V.S. VERNEY.

Sheep Scab.—There is an appreciable diminution in the number of outbreaks of this disease this month.

Lungsickness.—A fresh outbreak of this disease has occurred in a herd belonging to Mr. J. Wood, Pilgrim's Rest. The infection appears to have been obtained from a recent outbreak on the neighbouring farm. These cattle have been inoculated. There are now three herds under license for this disease.

Glanders.—A horse belonging to Messrs. Cooke & Co. having been declared to have been clinically affected with Glanders on arrival by train at Volksrust, I tested all the horses that had been in contact. One horse gave an undecided reaction, and is still under quarantine for further inoculation.

Biliary Fever.—This disease is really equine malarial fever, and the causal agent is a parasite infesting the blood. The disease is very similar in character to that causing Redwater in cattle, and has been somewhat prevalent. Animals chiefly affected are imported, or are those that have recently come from another district. The local horse rarely develops this disease, although I have seen this happen. Horses coming from East Griqualand and Basutoland into this district in the summer usually develop the disease. During the relief operations, General Buller obtained a number of Basuto ponies for his own riding, and most of these animals became ill from

Biliary Fever, which emphasised a well-known Colonial experience that the best horse for work is the local horse; that is, one generally finds, that a Mooi River horse is the best horse for Mooi River, and so on. Most cases of Biliary Fever yield to treatment, if treated in the early stages of the disease. The characteristic diagnostic feature of the disease is high temperature and yellowness of the lips, and membranes of the eye. Animals affected with this disease often, unfortunately, continue to eat until the last stages of the disease, and, consequently, often one is not called in until the animal is almost too ill to give any hope of successful treatment. The first symptom is dulness, and if horse-owners noticing this dulness (and often with it staring coat) would turn up the lips and eye membranes, and take the temperature, which is usually high, then this disease would be more frequently detected in its early stages.

The best treatment I have found for this disease is first to give eight ounces of Epsom salts and half-an-ounce of ginger, and then follow on with daily doses of spirits of nitre—one or two ounces—and keeping the horse out of the hot sun, and feeding lightly on bran and green stuff. In very bad cases further treatment is necessary, but the secret of success is early treatment.

Blue-tongue.—There has been a considerable amount of this disease this month, and on farms that one does not usually see the disease. Sheep-owners should recognise the importance of shade and early treatment.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Three fresh outbreaks have occurred during the month.

Rinderpest.—The outbreak at Tanya-Zunga, in the Umsinga Location is practically finished. This outbreak has proved very troublesome owing to the Natives refusing to have their cattle inoculated. To prevent the spread of infection as much as possible all the animals have been herded together in a small area, and out of fifty head of in-contact cattle, twenty-nine are dead. Only ten head belonging to a different owner were inoculated, and these have not taken the infection.

It appears almost impossible to stop the Natives trafficking between the Division and Zululand, from which place the infection was re-introduced.

Glanders.—I have had to destroy three clinical cases during the month.

Scab.—Only one license has been issued in the Umsinga Division for disease, and two for dipping in Dundee Division.

Horsesickness.—Twenty deaths from this disease have been reported in my District during the month.

I have lately seen several imported horses suffering from partial paralysis of the hind quarters. The cases develop gradually, and all have occurred among animals running at grass. Some of them breathe similar to a horse suffering from broken wind, and shew intermittent temperatures. The primary cause appears to be due to indigestion and disordered liver, brought about by the animals being strange to the veld grasses. The cases recover if taken off grass and treated with Ammon. Carb. and Nucis. Vom.

DURBAN.—D.V.S. AMOS.

IMPORTATIONS.

Sheep	...	...	...	8,831
Oxen	...	...	...	5,009
Mules	...	...	...	1,168
Horses	...	...	...	314
Heifers	...	...	...	305
Calves	...	...	...	10
Cows	...	...	...	1
Pigs	...	...	...	9
Dogs	...	...	...	19

Total Importations ... 15,666

Of the sheep, 7,056 wethers came from America, 1,470 ewes from America, 250 ewes from Australia, 50 rams from Australia, five from England.

Of the oxen, 3,653 came from Madagascar, and the remaining 1,356 from America. The Madagascar oxen were imported for trek purposes, and the American were fat slaughter oxen.

All the 1,168 mules came from America.

Of the horses, 265 came from Australia, 43 from America, six from England.

The 305 heifers and 10 calves were a special consignment from Australia to Repatriation Commission. They were treated specially and landed straight into

trucks from the ships, and were taken to Kromdraai, near Standerton. These cattle had been thoroughly inoculated with virulent redwater blood in Queensland, and came here with a supposed strong immunity, and as the Government, in terms of the contract, only take over those that are still alive at the end of six months, this should be an interesting shipment—and furnish some good detail re the immunising of cattle from Queensland—which certainly up to the present has proved to be useless in this country. One fact is positive, this shipment has been most carefully inoculated in Queensland by competent men, and if these die from redwater, then it may safely be said no animals in any number will survive here from Queensland.

The one cow and nine pigs came from England.

Lungsickness.—Nil.

Horsesickness.—I have seen four cases during the month, and have heard of three others, all of which have had a fatal termination.

Tetanus has been very prevalent. I have had one successful case with serum treatment, the other three cases were all too far advanced before serum could be obtained. All cases were traumatic in origin, and a noticeable symptom was that it affected the quarter, loin, and neck muscles alone, the jaw being movable within two hours of death.

Glanders has been most prevalent, especially in the Sydenham District. I have had one prosecution during the month, and a fine imposed of £5 for each count—(1) For not reporting glanders, and (2) For allowing diseased animals to stray on a common pasturage. I again draw your notice to the infection of the Eastern Vlei, and as long as animals are allowed promiscuously to graze there, we are bound to get fresh outbreaks of this disease. There is a tendency now for owners to fence in their stables, but it is only time lost as long as they allow their animals to intermix with other animals whilst grazing on an infected place. During January I have shot 31 clinical cases and 19 re-acted animals, making a total of 50 animals destroyed. As these deaths come from about 15 different stables, this disease has assumed a serious condition, and has kept me very busy

indeed, inoculating all in-contact animals. The strongest infection is certainly in the Sydenham District, and is due to irresponsible owners, such as Indians, allowing animals to die without finding out the cause of death, and the non-disinfection of stables, etc., and in consequence the whole of the animals have met the infection and then have been sold to neighbours, and in their turn infected another stable. I have closed entirely two stables and am keeping a strict supervision over the animals. All in contact have been tested, and I shall do so again at a later date. I am prosecuting one owner for non-reporting of this disease in the Sydenham District.

GREYTOWN.—D.V.S. CORDY.

Scab.—No fresh outbreaks. The District is practically clear of this disease at present.

Lungsickness.—There is every reason to hope that the disease has now been stamped out.

Glanders.—A case of Farcy occurred in a horse belonging to a Coolie working at Mr. Wood's brickyard, Greytown. Fortunately, the animal had not been stabled with any other horses, as there were very extensive lesions (Farcy buds) on the shoulder and wither. It was, of course, destroyed, and four others, which had been in the habit of grazing in the Vlei with it, were tested with Mallein, but gave no reaction. There remain two others which will be tested for the same reason, although I shall be somewhat surprised should they have contracted the disease, as the risk of infection while grazing in the open appears to be very small compared to that incurred when horses are stabled.

Rinderpest.—Two fresh outbreaks occurred during the month, north of the Middle Drift Road, and between that and the Hot Springs, Tugela. Five head of cattle had died, and four others were sick at the end of the month. This has caused a further extension of the quarantine, and the road to Middle Drift is now included, and therefore closed to cattle traffic. The remaining cattle at the two fresh outbreaks have all been inoculated. It is difficult to understand how these kraals became infected, as there were no sick

cattle within several miles of the spot; but unfortunately in a location the Natives appear to be able to move their cattle, when wishing to do so, in spite of quarantine guards, or any other restrictions.

Horsesickness.—A case of blue-tongue came under my notice; two other cases of horsesickness were reported from the Western Umvoti Division during the month.

HOWICK.—D.V.S. WEBB.

Scab.—None.

Redwater.—A local outbreak occurred on a farm at Balgowan, amongst some young stock which had recently been allowed to run in the bush. Two died and several others were sick. I prescribed treatment but have not heard the result.

Horsesickness.—Three cases have been brought to my notice in Howick village, I treated two, one died, the other recovered.

IXOPO.—D.V.S. POWER.

I have, as usual, had a very busy month, and according to your instructions attended at the different troop headquarters of the B.M.R. and examined horses for the Volunteer Department.

There are no fresh cases of a contagious nature to report in the District, though I have been called in a good many times during the month to investigate outbreaks of disease, which in the majority of cases turned out to be Redwater.

Scab.—No fresh outbreaks. Four flocks released in the Ixopo Division.

Mange.—Very few cases in the District at present.

Horsesickness.—I have heard of a few cases, but so far have not seen any this season.

Quarter-evil.—One case of this disease came under my notice early in the month.

Biliary Fever.—I treated a very bad case in an imported horse, and am glad to say he made a good recovery.

Redwater.—There has been a good deal of this disease, and more especially among young calves on different farms. I do not know if this has been the case in other districts of the Colony during the season, but certainly down these parts we

have had more than our share of Red-water amongst young calves that had never been off the farm on which they were bred. I regret to say that Mr. R. Vause's bull got a second attack and died within 48 hours of showing the first symptoms. At the present moment an imported Polled Angus bull, belonging to Messrs. Archibald & Co., Highflats, is suffering from this disease in a very virulent form, this being his second attack also.

VERULAM.—D.V.S. SHARPE.

Scab.—Nil.

Lungsickness.—There are two herds under license, one at Mapumulo and the other in Lower Umzimkulu.

Glanders.—Three mules were shot at Stanger.

Rinderpest.—Nil.

General.—There have been two deaths from Quarter-evil, and a few from Gall-sickness, but on the whole the stock appears to be healthy.

Mabele and Kafir Corn Aphis.

THE accompanying notes upon the latest scourge afflicting farmers in Natal have been supplied by Mr. Claude Fuller, Government Entomologist, who has received numerous enquiries on the subject from both the Province of Zululand and the County of Victoria.

The exact area of attack has not been defined, but it is hoped that those interested will report its presence and their experience of it to the Entomologist, supplying, whenever possible, data regarding the elevation, rainfall, and other conditions of the growing season, together with dates of planting, etc.

Speaking of the insect, the Entomologist says:—"A considerable amount of damage appears to have been done to mabele crops in certain parts of the Coast district during the first six weeks of this year (1903) by an extraordinary attack of aphis. The species which has wrought the damage I have not met hitherto, nor am I familiar with it, and so far have been unable to identify it with any known species. Speaking generally, aphides are not commonly indigenous to South Africa, and, while one cannot say that the species is a local one, at the same time it is impossible to regard it as an introduction. Up to the present only one party has claimed to have noticed the aphis on any previous occasion. The Natives are, I believe, quite unanimous in regarding it as something quite new.

"The damage done is quite unprecedented, and, from such observations as I have been able to make myself, it would

appear that in the area of infection the Native crops are utterly ruined, whilst the damage done to European cultivations is estimated at from 50 per cent. to 70 per cent. of the crop. The reason why the Native crops have suffered more severely may be sought in the fact that they plant as a rule later than Europeans. In the cultivations of the latter it is quite noticeable that crops on the hillsides have suffered more than those on vleis lands, no doubt owing to the drier nature of the soil.

"These aphides—as do all others—pump up the juices from the plants, and so, by depriving them of their nourishment, weaken and destroy them. The damage done by an individual aphis is hardly to be estimated, but the hordes in which they occur render them most mischievous. These vast numbers are to be accounted for by the rapidity with which the insects multiply, a rapidity of which some idea can be gained by the figures given by Reaumur, who calculated that the progeny of a single aphis will amount to 5,904,900,000 in the course of 30 to 70 days.

"Aphides, scale-insects, and frog-hoppers generally secrete or exude through pores in their bodies a sweet liquid, known as honey dew, and this is a substance which has so great an attraction for ants that the insects are regarded as the milch cows of the ant world. Whilst ants generally enjoy a great monopoly of the honey dew 'trade,' still they are not the only insects to which

honey dew is attractive, and I have often seen bees, wasps, and flies attracted to it in great numbers.

"A curious explanation of the outbreak of mabele aphid is given by the Kafirs from Zululand down to Verulam, which is to the effect that the aphides were first deposited by honey bees, and this explanation has, as usual, been swallowed *holus bolus* along with that pot nouri of Kafir superstition in which the farming lore of the Colony is steeped.

"Of course the simple explanation of the presence of bees, which were noticed swarming in infested fields, is to be found in the presence of a great flow of honey dew from the aphides, a flow so great that the leaves were 'greasy' with it and the ground beneath the plants often blackened with the growth of fumagine upon the honey dew which had fallen there.

"From the evidence before me at present, it is not possible to account for the sudden appearance of the insect any more than it can be said with any degree of certainty whether or not the pest will be as abundant and destructive in future. Such sudden outbreaks of insect pests have been known before, and they have in some instances proved more or less permanent in nature, so that it is extremely probable that the mabele aphid will occur next season in abundance; factors may arise, however, which may militate against its productiveness, and the attack may not be serious. It would be unwise, however, to venture any opinion in the matter.

"I have been asked whether I think the aphid is a new arrival, and, in reply, I can but state that, in view of its being a general and simultaneous outbreak over a large tract of country, the only rational conclusion is that the pest has existed in a harmless state unnoticed probably for some considerable time past.

"Granted that this is the case, there are two factors which may be looked to as influencing its prevalence this season. The prime factor may be looked for in some extraordinary climatic circumstances which may have handicapped the vigour of the crop and at the same time influenced the secondary factor which may

be described as the active checks upon the propagation of the aphides.

"With regard to the secondary factor, it may be stated definitely that the aphid is remarkably free from active checks. Recent examinations have shown that there exist at least four active checks, and these are a minute wasp parasite, a fungus parasite, a predaceous ladybird, and a predaceous maggot (*syrphus*). These are, however, extremely rare, the last-mentioned being the most abundant, and the first-mentioned the least. From a rough estimate made in the field (11.2.03), not one per 5,000 aphides were being destroyed by active checks.

"Upon the primary factor I have not sufficient data before me to base any argument, but the probability that some extraordinary climatic circumstance has occurred is very great. It is generally conceded that the season 1902-03 has so far been the driest for some thirteen or more years past in the infected area, and that in some parts of Zululand the drought has been so severe that the mealies are affected by it. As bearing upon this question, it may be stated that at Nonoti Peak, near Stanger—in a district where the mabele is suffering from aphid but the mealie crop is not showing the effects of drought—the rainfall for January of this year is only 1.62 inches, or 3.64 inches below the average for the past thirteen years. At the same place the rainfall for the mabele growing season, November, December, and January, is 11.56 inches, or 5.37 inches below the average for the past thirteen years."

A wheat farm of 40,000 acres is to be established in north-western Canada by an American syndicate.

Woodwork exposed to the weather frequently rots from the effect of water entering the joints. It has been suggested that this rotting may be largely prevented by the simple expedient of putting a little powdered sulphate of copper (bluestone) into mortises and joints when fixing the structure in position. Rotting of wood is largely due to the presence of fungi, and sulphate of copper is a powerful fungicide. Used in the manner suggested, any water entering a joint will diffuse the sulphate of copper through the wood and prevent its decay. So simple a remedy is worth trying.—*Agricultural News, Barbados.*

Coffee Disease.

THE following letter on coffee disease has been received by the Director of Agriculture. Appended are some remarks on the subject by the Government Entomologist:—

Zwolle,

30th January, 1903.

The Director of Agriculture, Maritzburg.

Sir,—I have had coffee on this estate since 1866, and I believe some of the old trees are still alive, due to having been under the shade of an orange breakwind. Some years ago my coffee trees were much affected with leaf disease, which, to the unscientific, bears a strong resemblance to "rust" in corn. It has, however, become much less of late years. Coffee failed in Natal from two causes: first, it requires 100 inches of rain per annum; second, an elevation of 3,000 to 4,000 feet. The prime cause of its failure was the inroads of an insect, the larva of a beetle native to Natal. The eggs of the beetle were laid on the sunny side of the tree, nine inches from the ground. The grub, on hatching, eats its way to the root, and devours all the bark right round the tree. Arrived at full growth—about $1\frac{1}{2}$ inches long—it bores its way up, and becomes a chrysalis just under the bark, to appear again as a beetle. Years ago I planted out a "*Gardenia capensis*," a flowering shrub or small tree; when in flower, it suddenly failed, and, on examination, I found the enemy of the coffee, which does not attack trees in the shade. The *Gardenia* referred to grows in shady places at the edges of the bush; the flowers are fine in the spring, and make a show in the Berea bush near Durban.

In conclusion, I may add that I have planted out a few hundred coffee trees under the shade of big Avocado pear trees.—I have, etc.,

H. W. JAMES.

Director.

Mr. James' remarks regarding coffee borer have been read with interest and

noted. This borer certainly did much damage, and the damage was the more serious because the coffee was planted thickly and tall thin saplings produced, which were usually killed by the presence of one borer. Where trees are planted 15 x 15, they are more vigorous, and, if sheltered, but little subject to the disease, and, the trunks being stouter, one or two borers do not affect their vigour materially. The exact life history of the borer is not completely known, but it appears that the egg-laying season is regular and limited in duration. If this proves so, I see no reason why something could not be devised to protect the trunks during that season.

As a matter of fact, coffee will do well if generously sheltered by good wind breaks, and planted about 15 x 15—the site and elevation being suitable.

CLAUDE FULLER,

Entomologist.

7th February, 1903.

Those who use fertilizers should remember *not* to use lime or basic slag which contains caustic lime, with sulphate of ammonia, guano or any animal or vegetable manures yielding ammonia. But limes may be used mixed with all potash manures, nitrate of soda, nitrate of potash, bones in any form *except* dissolved bones, mineral phosphates *except* super-phosphates.

A performing horse, owned and trained by a Scotsman named Banks, was famous in Queen Elizabeth's time. The tricks this horse performed were not very wonderful measured by modern standards, but they won great fame for him in those days. Banks took the horse over to France for exhibition, and, by way of stimulating curiosity, industriously spread a report that the animal was "possessed." The credulous French public were only too easily convinced that there was something diabolical about the horse, and the idea threatened serious consequences to Banks at one of his performances. He, with great readiness of wit, caused the horse to select from the audience a man wearing a cross on his hat, and kneel before the sacred emblem. He then called the threatening crowd to witness that the charge of possession by the devil or any evil spirit was utterly disproved; and the trick served his turn.

Phosphates for Cattle.

BY THE DIRECTOR OF AGRICULTURE.

A PROMINENT Natal farmer asked me a few days ago if it were possible to give phosphates in some form of cattle lick so as to supply the cattle with the element which they were formerly able to obtain by chewing bones, but of which they had been in great part de-

prived since bones had been collected for the manufacture of bone dust.

There is no doubt about the possibility of preparing a suitable cattle lick for the administration of phosphates. A very good preparation could be made somewhat in the following way:—

Take—1 part by weight of Albert's Concentrated Superphosphate (45 % Sol. Phos. Acid).

2 parts	"	Ordinary Soda.
7 "	"	Agricultural Salt.
25 "	"	Water.

Or—3 parts by weight Ordinary Superphosphate (15 % Sol. Phos. Acid).

2 "	"	Soda.
7 "	"	Salt.
25 "	"	Water.

Make a solution, boil down to dryness with constant stirring, allow to set in a mould, and harden and cement the brick by dipping in water and re-drying. Such a lick could easily be prepared by manufacturing chemists or by manure manufacturers, and could be placed on the market in the usual way. There should be no difficulty about it.

But, although it would be easy enough to prepare such a lick, there is no doubt this is not the best way of administering phosphates to cattle. The best way from all points of view is to manure the pasture so that the cattle can take in the phosphates through the grass they eat. Dr. Dadd, in his *American Cattle Doctor*, says:—"I have no objection to offer against the popular custom of giving the patient a few doses of bone meal; . . . yet I would suggest to the intelligent reader that, as bruised oats, ground corn, and linseed meal contain a large amount of phosphates, they should be selected in preference to bone meal." And again:—"I should prefer to use nutritious food, tonics, and stimulants, instead of bone meal. Why not add the bone meal to the barnyard manure? In this way the animal would get the benefit of it in the form of fodder."

There is some danger in allowing cattle to chew bones, for it will be readily understood that the bones may convey the germs of infectious diseases. A craving for bones on the part of herbivorous

animals is a depraved appetite and somewhat unnatural, and indicates a want of something in the ordinary diet of the animals. The craving for bones is evinced in an accentuated form by cattle affected with the disease known as "cripples" and by some other obscure disorders which arise from innutritious diet. I have known of many cases in which cripples and other disorders entirely disappeared from farms after the pasture paddocks had been manured with superphosphate at the rate of one or two cwt. to the acre.

The effect of such manuring goes much further than in the mere supplying of phosphates. Improvement results in both the quality and the quantity of the pasture, so that the carrying capacity of the land may be doubled and even trebled. As the market value of land rises it will become more and more unprofitable to leave extensive areas to natural unimproved pasture. There are many ways of improving pasture, but there is none simpler than the application of phosphatic manures. Some of the more valuable grasses respond more readily to manuring than the inferior grasses do, and, under favourable conditions, the better grasses in manured pasture thrive and to a great extent crowd out the inferior grasses.

There is, of course, a difficulty in manuring unfenced pasture land. Unless the whole of the land were manured at once—and this would be impracticable

over thousands of acres—the cattle would naturally neglect the unmanured pasture for the manured, which they would injure by over-grazing. This difficulty could be overcome by putting a light fence around the manured area, and admitting the cattle only at stated times. The difficulty will disappear with the progress of agriculture in Natal, for as land becomes more valuable it will be found indispensable to sub-divide the pasture into paddocks to be systematically grazed in.

At the Central Experiment Farm ten small paddocks are being fenced off for

experiments in the improvement of pasture. When the results of the experiments begin to appear, they will serve as a guide to all stock farmers throughout the country. In the meantime it is safe to recommend some of the more enterprising of these farmers to begin by experimenting in a small way in manuring their pasture with phosphatic manures. The best for the purpose will probably be superphosphate at the rate of from one to two cwt. per acre, given in the early spring, so as to be washed into the soil with the early rains.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 3a.—A Scotsman, 27 years of age, who has been in Natal 18 months; came out on account of his health; produces good testimonials from Home and Colonial employers. Wishes to learn farming; is prepared to give his services in return for his board and lodging for a few months.

No. 13a.—An Australian, who has been serving throughout the war, is recommended with every confidence by his Commanding Officer. Asks for salary of £84 per annum.

No. 17a.—Australian of 27. Has had considerable experience in New South Wales, and has taken sole charge of several sheep and cattle stations with credit. Produces excellent recommendations.

No. 21a.—Applicant is 25, and of Scotch descent. Has had several years' experience as an overseer on a sugar plantation in the West Indies; is acquainted with book-keeping.

No. 22a.—A corporal in the Imperial Yeomanry. Is 24, has had experience of mixed farming in England, and is prepared to accept an engagement on a farm in Natal.

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales,

where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 29a.—A married man of 32. Was trained as a nurseryman in England; was engaged for three years upon forestry work with the Transvaal Gold, Land and Exploration Co., where he had entire charge of a plantation of 300 acres. Must have a living wage.

No. 30a.—Has had a number of years' experience of agricultural and stock farming in Umvoti County, and is prepared to take a situation as an assistant on a farm. Give good references.

No. 31a.—Is at present attached to the K.S.L.I., but is anxious to become an assistant on a farm. Is 27, and has had ten years' Home and Colonial farm experience.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

No. 40a.—Aged 26, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barberton District of Transvaal. Is anxious to get work, irrespective to nature of employment.

No. 41a.—Gentlemanly young man of 22. Has slight knowledge of Viticulture. Is anxious to acquire knowledge of agricultural and stock farming. Appears energetic, and would doubtless be of great assistance to a progressive farmer.

No. 42a.—Englishman, 24 years of age. Has had life experience of agricultural, stock, and dairy farming in Cheshire, where he had the management of a farm, and gained several prizes for cheese-making. Is anxious to get on to a dairy farm, if possible.

Disease Investigation.

APPOINTMENT OF DR. WATKINS-PITCHFORD.

IT will be noted with satisfaction by those interested in the urgent question of disease investigation in the Colony that the Government has, in response to a request from the Government Bacteriologist and Director, Veterinary Department, appointed Dr. Watkins-Pitchford as Professional Assistant in the Laboratory at Maritzburg.

The work of this institution has rapidly increased within the last few years, and it has been necessary to meet the great and increasing demand for preventive remedies of all sorts. This line of work entails scrupulous care and a close supervision of detail in order to ensure the efficacy and safety of such preparations; and, while this line of work appertains properly to an institution such as the Pietermaritzburg Laboratory, it will be seen that the Director of the Institute—who has hitherto been without professional assistance—has not, in consequence, been able to give as much individual attention to the important branch of disease investigation as he would like, or, indeed, urgent necessity of such subject demands.

On representing the matter in this light, the Government readily acquiesced in the Director's request for professional assistance in the work. Numerous applications were made to the Government, in response to an advertisement for a skilled and experienced scientific worker, and Dr. Pitchford, who has recently been holding the position of Assistant Medical Officer for the Borough of Holborn, was chosen from amongst some fifty applicants as possessing not only extensive experience and aptitude for the work, but also the highest academic qualifications. Dr. Pitchford is a Fellow of the Royal College of Surgeons, and a Doctor of Medicine of the London University, holding in addition the Diplomas in Public Health for the Universities of Oxford and London. During the second great epidemic of Plague in Bombay, Dr Pitchford was engaged by the Indian Government for the purpose of Plague investigation, and he has taken over the present appointment by reason of the great opportunities for scientific investigation which he hopes it will afford.

Mabele Aphs.

To the Editor Agricultural Journal.

DEAR SIR,—Can you inform me through the medium of the *Journal* whether the Agricultural Department are aware of the new parasite which is destroying all the mabele crops in this district and Zululand?

The farmers down here turn their cattle into the fields after reaping the grain, so I think the matter ought to be looked into, as the small insects which are doing the harm collect in great numbers on the under side of the leaves. If the

cattle eat the leaves it might cause their death.—I remain, yours faithfully,

FRANCIS SAVILLE.

Spitzkop Farm,
Upper-Tonga P.O.

[Elsewhere in this issue an article will be found dealing with this subject. The Government Entomologist is of opinion that cattle, in eating the affected mabele, will incur no danger.—Ed., *Agricultural Journal*.]

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab " Lung sickness	N. Grant ... P. G. Boshoff ... J. Wood ...	Brakfontein. Smaldeal. Pilgims' Rest.
J. Button ..	Estcourt, South of Bushman's River	Scab " Lung sickness "	P. Ballantyne ... J. B. Brewitt' ... R. B. Wright	Weston Town Lands. Wagon Drift. The Alps.
K. Soutar ...	Portion of Lion's River	Scab "	C. J. Smythe ... J. Chadwick ...	Stratherne. Howard.
R. Vause ...	Ixopo ...	" "	Shelana ... J. P. Vause ... Ikonyela ...	Mackenzie. Thorninghurst. Springvale.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
R. J. Raw ...	Impendhle ...	Scab "	Mahandan ... Nomandindi ...	Impendhle Location "
A. H. Ball ...	Weenen ...	"	J. Crathorne ...	Beaconsfield.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
W. Wilson ...	Ipolela ...	" " " "	J. Hayes R. M. & D. Arbuckle J. Morrison ... Earnshaw & Hilton C. A. Phipson ...	Glengarriff Costmore. Glenmar. Pierremont. Strath Campbell
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Vanderplank ...	Lovedale.
G. N. Perfect ...	Umvoti, East ...	"	Thos. Hill ...	Stolzenvols.
A. S. Parkinson ...	New Hanover ...	" "	Makenke & others Bongola & others }	Swazimana's Location.
E. Varty ...	Umvoti, West	"	E. Simkins ...	Holmesdale
C. J. Van Rooyen	Krantzkop ...	"	H. T. Van Rooyen	Krantzkop.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lung sickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 70 herds of cattle under license for Lung sickness, and 10 flocks of sheep under license for Scab as under :—

Natal—Newcastle Division	...	...	...	4 for Lung sickness, — for Scab
Klip River	...	...	...	12 " 2 "
Dundee	...	...	...	2 " 6 "
Umsinga	...	...	...	2 " — "
Upper Tugela (North of Tugela River) Division	...	...	...	— " 1 "

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni

Districts	...	23	"	—	"
Nkandhla and Nqutu Districts...	...	21	"	1	"
North of White Umfolosi and Umfolosi Rivers	...	6	"	—	"
Total	...	70		10	

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Town Lands, Ladysmith.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu. District, Nkandhla District, Ndwanwe District, Nongomo District.

Krantzkop Division :—Amobonvu Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 28th February, 1903.

Meteorological Returns.*Meteorological Observations taken at Government Stations for Month of January, 1903.*

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same period from July 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	86.5	69.0	95	61.4	2.44	18	.55	29th	20.49	31.87
Stanger... ..	90.2	68.7	115	60	1.91	21	.81	18th	22.94	31.04
Verulam	89.9	69.5	110	57	2.90	16	1.05	28th	20.79	27.09
Newcastle	92.6	71.9	100	63	4.59	10	1.09	18th	13.59	22.34
Estcourt	89.5	59.0	110	47	5.10	8	2.25	8th	15.93	19.56
Umzinto	83.3	54.7	105.5	52.5	3.64	9	2.05	26th	27.46	24.72
Maritzburg	87.8	60.5	105.0	52.0	1.23	16	.18	24th & 26th	13.63	20.85
Howick... ..	86.3	59.2	98	50	1.76	17	.43	6th	12.02	20.46
Ladysmith	97.0	61.5	118	50	2.32	9	1.01	4th	8.52	...
Dundee... ..	92.1	63.4	97	54	5.79	13	1.56	27th	14.52	25.54
Weenen ... ..	...	...	...	...	4.31	12	1.70	16th	15.03	16.90
New Hanover	91.8	62.3	104	52	.52	11	.18	13th	14.33	23.47
Mapumulo	90.7	56.1	110.5	40	.96	5	.30	7th	19.77	28.45
Nongoma	81.5	63.1	94	55	2.87	7	1.00	7th & 14th	...	28.89
N'Kandhla	82.5	45.0	93	40	1.10	2	1.00	8th	...	...
Qudeni	76.2	54.1	87	40	4.59	23	2.03	4th	25.72	39.66
Hlabisa	89.0	67.5	99	56	4.00	5	1.60	13th	...	27.70
Melmoth	85.0	63.3	109	54	4.32	10	2.70	14th	16.50	22.46
Eshowe... ..	83.3	64.7	104	57	2.20	12	.85	1st	26.72	38.96
Point ... ..	...	...	...	...	1.55	9	.49	28th	...	20.09
Ndwedwe	80.9	61.9	100	55	...	...	...	...	...	...
Nqutu	81.5	49.0	95	39	3.86	13	.83	28th	12.08	...
S. C. Junction ... ..	...	...	...	...	1.74	13	.36	29th	18.47	31.72

Weekly Rinderpest Report.

UP TO 17TH FEBRUARY, 1903.

Ladysmith Division.

Ladysmith Commonage, near Umbulwana.—Fresh outbreak. Cattle of Isaacs. 1 dead ; 2 sick.

Krantzkop Division.

Amobonvu Location.—4 fresh outbreaks. 8 dead ; 10 sick.

Zululand.

Eshowe District.—30 dead ; 26 sick.

Mahlabatini District.—2 dead ; 6 sick.

Umlalazi District.—9 dead ; 15 sick.

Lower Umfolosi District.—7 dead ; 3 sick.

Ndwanwe District.—21 dead ; 32 sick.

Nkandhla District.—No report received.

S. B. WOOLLATT,

P.V. Surgeon.

17th February, 1903.

Manure Drills.

WITH reference to the manure drill he is importing, Mr. John Moon writes to say:—"It will sow oats as well as manure, and does it as well as anyone could wish it to be done. I tried it last week with oats, and could not have wished

for anything better, so that will be another great saving to those who have them. I have sold about fifty, and have another forty on order from England, and about thirty of those are sold, so that speaks well for them."

Sheep Stealing Case.

AT the Criminal Sessions on Monday, before the Chief Justice (Sir Henry Bale) and a jury, Robert Wm. Moyles, a farmer in the Polela District, was indicted on a charge of stealing six sheep, the property of Mrs. Fraser, a neighbouring farmer.

The Attorney-General prosecuted, and Mr. A. R. Pierson defended.

The Attorney-General, in opening the case, said that in the spring Mrs. Fraser began to lose sheep. She noticed them disappearing, especially towards the end of July, by which time she had lost over 40. The prisoner's farm was on the opposite bank of the Umzimkulu. Amongst the sheep sheared by him on November 7th were the sheep referred to in the indictment, including a black lamb, which undoubtedly belonged to Mrs. Fraser.

Mrs. Fraser said she had a flock of 700 sheep, of which she had lost in all about 80. In October last an employee of hers, named Taylor, recovered the black lamb, and the remaining five sheep were identified by a swallow tail ear-mark in the left ears, except in one case, where the mark was obliterated. They also bore the stamp "F 1," as well as the prisoner's stamp "M." The right ears were cut off. The prisoner told her that his herd boy was "so many" short, and he warned him that unless he recovered them his father would have to pay for them. The boy must have consequently taken the witness's sheep to make up the loss, and must have shorn and marked them. Prisoner, however, offered to pay witness anything to recoup her for the loss. Witness replied that he could not pay for the sheep. He re-asserted that it was done by one of his boys, and she rejoined that she could not let the boy off. She afterwards went to the Magistrate.

Mbilizini, the boy accused by the prisoner, deposed to seeing his master obliterate the ear-marks of the sheep in question, and remark and brand them. When he was tampering with the lamb witness said it did not be-

long to him but to "the lady." Prisoner replied: "It does not matter." Witness denied that he himself cut the ears of the sheep alleged to have been stolen.

Sijuba, another Native employee, stated that he heard one of the clippers had taken hold of a sheep that did not belong to prisoner, and the latter replied, "It does not matter."

Alexander Taylor said he looked after Mrs. Fraser's sheep. He went to the prisoner's when the latter was shearing for the purpose of seeing if there were any of Mrs. Fraser's sheep in his flock. He said there was none there then, and he seemed very anxious for witness to go, which he did. He found the sheep referred to in the indictment on November 16th. They were grazing on the Crown lands, abutting on the farms of Mrs. Fraser and the prisoner. They had left the prisoner's flock, and were evidently going back to their own flock. The prisoner's flock was on the Crown lands.

Mr. Pierson called the prisoner, who said he had a conversation with Mrs. Fraser, in the course of which he stated that if any of her sheep had got into his flock by mistake he would pay for them. When he was branding the sheep in question he had no idea that they were not his property, and immediately he found he had made a mistake he attempted to rectify it. He was in the Border Mounted Rifles, and had served during the war.

Cross-examined: He had no doubt that the herd boy cut off the ears of the sheep. Whilst branding them he did not notice that any ears had been tampered with, and the mutilation must have taken place subsequently. He denied the evidence of the three Native witnesses who had been in his employ. He could not account for their story.

The Chief Justice said, in passing sentence: I assume, of course, that hitherto you have been a man of good character. Under the Cattle Stealing Law the maximum penalty provided for in the case of Natives is two

years. It is competent for me to impose a higher or a lower penalty, if so minded, but I think I should be doing wrong if I imposed a higher than is considered the maximum in the case of Natives, especially in this case, where there are no circumstances which exaggerate

the offence. I think the justice of the case will be met by your being imprisoned for 18 months with hard labour.

The prisoner appeared dumbfounded.—*Witness.*

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG—

Apples—3s to 6s per box.
 Apricots—1s to 1s 6d per 100.
 Bananas—1s. to 1s per bunch.
 Beans (green)—6d to 1s 8d per lot.
 Bringalls 1s to 1s 6d per lot.
 Butter (fresh)—11d to 1s 9d per lb.
 Cabbages—2s per doz.
 Carrots—1s 5d per bunch.
 Celery—1s per lot.
 Chillies—6d to 9d per lot.
 Cucumbers—1s 6d per lot.
 Eggs—2s 3d to 3s 3d per doz.
 Eschalots—3d per bunch.
 Flowers—6d per bunch.
 Forage—6s to 8s 4d per 100lbs.
 Fowls—1s 6d to 4s 6d each.
 Grenadillas—2s to 2s 6d per 30.
 Herbs—6d per lot.
 Lemons—1s to 2s per lot.
 Lettuce—6d to 1s per lot.
 Mutton—6d to 9d per lb.
 Marrows—1s to 1s 6d per lot.
 Green Mealies—9d per lot.
 Pears—7s 6d per lot.
 Peas (green)—9d per lot.
 Plums—3d per lb.
 Peaches—1s to 10s per lot.
 Papaws—1s per lot.
 Pineapples—1s to 2s 6d per doz.
 Potatoes—6s to 8s per 100lbs.
 Pumpkins—10s per doz.
 Rabbits—6d to 1s each.
 Rhubarb—9d to 1s per bunch.
 Tomatoes—1s to 2s per lot.
 Turnips—6d per lot.
 Wood—10d per 100lbs.

DURBAN.—Mealies, 18s. 9d. to 21s. per muid; apricots, 3s. 6d. to 7s. per 100; avocado pears, 1s. 9d. to 4s. per doz.; apples, 1s. 9d. to 4s. 6d. per 100; bananas, 1s. 3d. to 2s. per bunch; bananas, 1s. 6d. to 2s. 4d. per 100; beans, red, 13s. 6d. to 18s. per muid; butter (fresh), 1s. 5d. to 1s. 11d. per lb.; butter, 7d. to 11d. per lb.; cabbages, 2s. 6d. to 8s. per doz.; ducks, 3s. 6d. to 4s. 11d. each; eggs, 2s. 9d. to 3s. 5d. per doz.; fowls, 1s. 11d. to 7s. each; grenadillas, 1s. 6d. to 2s. per 100; grapes, 2d. to 7d. per lb.; ground nuts, 4s. 6d.

per sack; lemons, 2s. 6d. to 4s. per 100; limes, 1s. to 2s. 3d. per 100; mangoes, 2s. to 3s. 6d. per doz.; oranges, 2s. to 5s. 6d. per 100; papaws, 1s. to 1s. 9d. per doz.; pigs. (suckling), 4s. 6d. to 9s. each; pineapples, 1s. to 2s. 3d. per doz.; potatoes (round), 14s. to 16s. per muid; potatoes (sweet), 5s. 6d. per muid; tomatoes, 3s. to 8s. 6d. per basket; turkeys, 14s. to 17s. each; turnips, 1s. 9d. to 3s. per bag.

From Victoria comes an allegation of a serious character against a show judge. It is alleged that the judge, who had been held in the highest esteem, has been awarding prizes to his own sheep, which had been exhibited by "dummy" owners. In October last suspicion was aroused, and a leading detective was put on to investigate the matter. He has paid two visits to Gippsland and made all the necessary inquiries.

The outbreak of anthrax in Southland, New Zealand, has been traced practically beyond doubt to Calcutta bones imported to the Bluff at the end of September. Our readers will remember that Dr. Willmott, the Tasmanian Government Veterinary Surgeon, traced the outbreak of anthrax in pigs on the north-west coast of Tasmania to the importation of bone dust. The pigs had eaten of the bone dust and so became infected.—*Station, Farm, and Dairy.*

Pedigree Pigs.

I HAVE for Sale **Four Boars and Three Sows, Pedigree Berkshire Pigs**, age 10 weeks on the 24th of February. Price, Three Guineas. Particulars on application to—

C. W. B. SCOTT,

Box 167,
 Pietermaritzburg.

The Agricultural Journal

AND MINING RECORD.

VOL. VI.

FRIDAY, MARCH 6, 1903.

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Pruning of Fruit Trees.

By T. R. SIM, Conservator of Forests.

A CORRESPONDENT in this issue of the *Agricultural Journal* takes exception to Mr. Fred. Symons' statement that pruning is a debateable subject, and quotes American opinion as being entirely in favour of pruning. That, however, only shows one side of the subject, while the fact that a very large proportion of the English orchards are still unpruned shows that there are believers in the opposite view, whether they have reasonable grounds or not for such a belief.

The position may be put thus :—A fruit tree, like any other animate object, naturally aims at reproducing itself, or rather its kind ; and, in furtherance of that object, the production of seed is its chief end in life. To produce seeds the production of fruit is necessary, and with reasonable feeding and cultivation that fruit can be of very high quality, irrespective of pruning. A fruit tree in its natural condition does not, however, begin to fruit at an early age ; it rather devotes

its early vigour to growing into what is its natural size, and then, on reaching maturity, the fruiting commences in earnest. Fruits may be produced earlier, but these indicate precocity in the kind; the natural sequence in most fruit trees enjoying vigorous health being growth first and fruit afterwards. That being so, the production of a full crop from an unpruned tree usually occurs high up among the top branches, the fruiting buds in almost all fruit trees being produced on the branches most exposed to open air, which naturally are the highest and most spreading ones. These exposed branches often produce fruit-buds along their whole lengths, but, if there is sap enough, those near the points flower first and secure fertilisation, and the rest then become abortive. The result is that on unpruned trees of vigorous habit, the fruit are produced at the points of rather long and fully exposed branches, barely fit to support them; they dangle about in the wind, and when mature are in inaccessible positions, and have to fall or be knocked to the ground, or be gathered from the trees by the use of long ladders. In suitable surrounding, however, they often get beyond the reach of ladders, and I have in mind many fine fruit trees, especially pears, in Cradock and other Karroo towns, which carry grand crops of good fruit 50 to 70 feet above the ground. The soil there is rich, deep alluvial, and is irrigated when necessary.

A pruned tree, on the other hand, is an artificial production, in which Nature is subdued, kept in check, and regulated only in accordance with the skill and persistence of the operator. The extent and object of the pruning may vary considerably, but usually the object is twofold:—

1. To produce, in the first case, and afterwards keep in the same condition, a tree from which the fruit can be gathered direct into the basket and sent to market or table without a bruise.

2. To change the whole nature of the tree from one of wood production to one of fruit production; that is, to take the vegetative vigour out of it and to produce an unnatural and precocious tendency to fruit.

Now, abundant fruiting, in a tree, whether pruned or not, usually has the effect of further checking the vegetative vigour and increasing the tendency to become reproductive. Any other circumstance which in a similar manner checks the wood growth usually hastens maturity and increases the fruit crop, such as, for instance, the root-pruning of an over-luxuriant tree, chopping incisions in the bark, or allowing rats or sheep to gnaw part of the bark away, and it is a common practice to use stocks of the less vigorous kinds on which to graft the stronger growers, and thereby produce a similar check.

Mr. Symons mentions that Nature supplies the necessary check in the case, when he says, "The climate here is dry, and the trees do not make anything like the wood which those nearer the coast do." The same thing occurs in many places, especially in the drier parts of Cape Colony, where, if irrigation is irregular, or not practised at all, the crops of good fruits are enormous from trees which in spring are too dried out to send sap to the points of the branches, and consequently fruit on spurs lower down. In such case, too, fewer twigs are produced, and consequently abundant air is admitted to all parts of the tree. It will be seen then that Nature in some cases prunes or checks to a considerable degree, and each orchardist has to study his own conditions and his own kinds in deciding whether or not he will prune. (All this, of course, refers to deciduous fruit trees only, and does not apply to citrus or other evergreen kinds, in which the treatment is different). But "pruning" is a wide term, and is understood differently by different growers.

- (1) The most advanced orchardists believe in a totally artificial tree, which is made, and continues to be such, simply through the unremitting attention paid to it in the matter of pruning, though much of that pruning is done with the thumb nail rather than with the knife, *i.e.*, summer regulation of the young green shoots, to such an extent as to fully mature, by free contact with fresh air, every shoot that is left.

(2) Others, again, believe in pruning scientifically only for the first three or four years, that is, until the tree has assumed the desired shape, and thereafter doing only a limited amount of pruning, especially if, as often happens, Nature assists by means of drought, hail, or other causes.

(3) Others again do not prune at all when the trees are young, but in after years saw out heavy branches and thereby admit air.

Of these various methods the first is distinctly the most profitable where climatic and soil conditions are altogether favourable, and where skilled labour is always obtainable at reasonable cost. The six Europeans of Mr. Symons could not do everything in 30 acres of orchard on these lines, and it then comes to be a debatable subject whether additional skilled labour will pay better than by adopting the second method, in which dwarfing stocks and natural cheeks do a good deal of the work after the first few years. In commercial orchard work skilled pruning usually pays, but it is no uncommon case also to find, taking all the surrounding conditions and circumstances into consideration, that skilled abstention from pruning pays better than unskilled pruning.

The third method suits the man who grows his firewood in his apple trees, at the expense of his crop, and who does not have sufficient skill or sufficient energy to do anything better. He is satisfied

with second-rate fruit, in small quantity, and uses six acres to produce what one acre should do, and then gets lowest prices. Still it is the method used almost exclusively in all the cider and jam producing orchards in England and New England; it is a low-grade method, producing inferior fruit suitable only for low-grade industries and often unsuitable for market, but it pays the man whose low-grade ability would oust him altogether from the production of first-class market fruit.

For the production of first-rate market fruit one or other of the first two methods must be used, surrounding circumstances deciding in each case which it has to be, but in a general way it may be said that scientific pruning is the more successful coastward, or on low alluvial valleys, while on high and fairly dry ridges and where labour is unobtainable the second method makes a fairly good substitute.

I trust no one will construe this into an excuse for slovenly negligence of necessary pruning; I also trust that your correspondent will see that there is room for debate as to how much pruning should be done, and in some places whether any at all should be done beyond producing the form of the tree at the start.

It is evident that market fruit cannot be successfully gathered from trees 70 feet high, but it is also as evident that where Nature and kind of stock keep the trees reasonably dwarf, and productive of full crops of good fruit upon stem-spurs, very little, if any, pruning is wanted.

Paspalum Dilatatum.

SO great has been the demand for *Paspalum dilatatum* that the supply which was received by the Department some little time ago has completely run out. Steps, however, are being taken to obtain a further supply, and when this arrives parcels of the seed will be forwarded to those whose applications have been received too late for supply from recent stock, and also to others who may apply.

In connection with the above notice, it may be mentioned that Mr. F. Churchill

informs us that when lately in the Transvaal he noticed accidental growths of *Paspalum dilatatum* in front of the Pretoria Club and at several places along the railway.

The following letter from Mr. Geo. Langley, Boys' Kraal, Dannhauser, on *Paspalum dilatatum*, has been received by the Minister of Agriculture and is published for general information:—

I beg to report on sample of *Paspalum dilatatum* seed, which was forwarded to

me by your Department and planted in February, 1902 :—

This was sown in old land, the seed being mixed with bone dust and drilled in with the mealie planter, which was set to plant very shallow.

The soil is a dry red clay, near the whinstone, and, being an old mealie land, was full of grass and weeds.

The Paspalum is now about two feet high, and, although it has never been cleaned or cultivated, is quite master of the situation. I am of opinion that this will make a useful fodder for farms growing sweet veld only, as the Paspalum kept green here until June, whereas the frost whitens sweet grass by the end of April.

Japanese Plums.

THE name of the Japanese plum tree growing at Mr. Harwin Pepworth's farm Faugh-a-Ballagh, of which an illustration was given in No. 3 of the present volume, is the Kelsey. The only reason that Mr. Pepworth can suggest for the failure of the tree to bear fruit at his place in the Zwartkop Valley is in-

sufficiency of rest; he thinks that this plum tree requires seasonable cold weather. With him the tree blooms in the very early spring, and when the September winds come the result is disastrous to the fruit, which, in his opinion, has not set sufficiently to withstand those winds.

Rhodesian Disease in Transvaal.

FROM the latest reports, it would appear that the Rhodesian Disease in the Transvaal is chiefly confined to the

low veld in the Lydenburg and Barberton Districts, Nelspruit being the chief centre.

North Coast Mealies.

MR. GILBERT WILKINSON, Ottawa, writing on the 3rd inst., says :—

Early planted mealies—first week in September—have done fairly well, and are now being offered for sale. Those planted in December have felt the want of rain, and probably there will be only

half a crop. Mabele has the blight. Cow peas are very backward. Locusts in this vicinity have mostly been exterminated. Hloko-hloko birds have been very numerous this year, and have done considerable damage to young mealies.

Mapstone Oats.

THE Minister of Agriculture has received the following report on Mapstone oats from Mr. W. Gower Shaw, Colbourne, Woodside, which is published for general information :—"I have reaped

200lbs. of seed oats from the 50lbs. of Mapstone seed obtained last March. I should like to replant the oats due to the Department. Rust got into the crop, but with the frosts it disappeared."

District Reports.

HOWICK, 25th February.—Since my last report matters have slightly improved, 2.27 inches of rain having fallen during the interval. This rain has had the effect of brightening up the backward crops. However, the showers of rain have been for the most part local, and there has been little general rain. Grain, especially among the Natives, is becoming scarce in the District, with the consequence that beer-drinking gatherings are becoming the exception rather than the rule. Stock of all kinds is in good condition and free from infectious diseases. During the past month the maximum temperature was 97 degrees, registered on the 1st and 2nd inst., and the minimum during the same period was 50 degrees, registered on 24th inst. I would take this opportunity of informing residents of this Division that their dog licenses for the current year must now be taken out. I would also draw attention to Rules 2 and 8 of Rules and Regulations issued under Section 4, Law 27, 1875, *vide* Proclamation No. 12, 1887, which reads as follows:—Rule 2. "Every dog above the age of six months shall be licensed and wear a numbered collar or strap." Rule 8. "No dog shall be considered licensed unless the number of the collar or strap worn by such dog shall correspond with the number specified in the license held by the owner or person in charge of same."

J. W. CROSS, Magistrate.

PAULPIETERSBURG, 20th February.—The village of Paulpietersburg is situated 28 miles, approximately, north of Vryheid. It lies at the foot of the huge Dumbé Mountain, and is about 6 miles from Joubert's Drift, on the Pongola River, which separates the Division from that of Piet Retief. The village consists (or rather consisted) of about forty houses, two churches, and one hotel, all of which have been more or less damaged or destroyed during the war. A four feet seam of excellent coal occurs on the Dumbé Mountain, which, by the way, forms a portion of the town lands, but owing to the insecurity of the coal mine and the great difficulty of approaching it, the residents have had to resort to wattle wood for fuel, which is only obtainable at exorbitant prices. The Government, however, is taking steps to have a quantity of coal mined and brought down the mountain, which will be a decided boon to the residents of the village and Division. A Government school, under Mr. Fowle, has been opened with a roll of 20; this number should speedily increase to 30 or 40. The Natives are quiet and well behaved, and are on the whole working satisfactorily. The soil is very fertile, more especially that of Luneburg District, in the upper portion of this Division. (Luneburg, I should say, is a

large settlement of German colonists, very much the same, but on a larger scale, than New Germany in old Natal). The crops in this part of the Division are looking very well, and promise large harvests; in some other parts, however, the mealie crop will be, I fear, a failure. The soil is eminently suited for tobacco cultivation, and is stated to be second only to that of Magliesburg. I can quite believe this, as some of the tobacco I have sampled is of excellent quality. Fruit production is a leading industry of the Division, and some of the orchards I have seen will bear comparison with some of the best in Natal, notably that of Mr. C. T. Labuschagne, of the farm Nooitgedacht. An outbreak of rinderpest has occurred at some Native kraals near the junction of the Pongolo and Pivaan Rivers. The farms infected have been placed under quarantine, and an inoculator sent to inoculate the cattle within the area. I regret to say that the Natives have refused to avail themselves of the precaution. As far as I am aware, there are no other cases of stock diseases in the Division. During the early part of the season horse-sickness was rife, six horses were reported to have died from the disease, but latterly I have heard of no further cases, though the disease may develop towards April. At present the District is devoid of sheep, but I hear that these useful animals thrive well all over the uplands. As regards minerals, this very important asset has only been touched upon, quartz and banket reefs of fair quality are being tested, and I have hopes of success, but I am not going to commit myself to any geological forecasts, for the simple reason that I do not know anything about the value of the hidden treasures. The hillsides gleam with outcrops of quartz, the shales glimmer with mica; granite and quartzite bars stand out on every hand, and prospectors tell me that they "are on colour and get tails," so I will leave to them the stupendous task of testing, with the hope that, by honest endeavour, their labours will result in the production of solid ingots of gold and other precious metals. A rush is anticipated to peg off Government farms on and after the 27th February. The weather during the past few weeks appears to be the same as that experienced in old Natal. In some parts but little rain has fallen, and the days are exceptionally hot with a maximum temperature of 96 in the shade.

D. ADAMSON, Acting Magistrate.

WEENEN, 1st March.—Indeed, an evil omen seems to be over Weenen. On Saturday evening last another hailstorm fell upon the Village, doing considerable damage to crops and window glass. To sympathise with each other is all we can do. This storm makes the third within ten

months, and naturally makes one dubious of sowing crops. Hope ful's the farmer where these storms are, as one might say, continually in anticipation. Stock looks well. All the Police horses, at Weenen and Umhlumba, have been shot for glanders. This being the case I can only conjecture that this much-dreaded disease is rife in the Division, and the sooner it is stamped out the better for all concerned. I have just returned from the Tugela Irrigation Works, where I found magnificent crops of mealies and mabele. These are grown by the Abatembu tribe, living in that part of the location, and all under the direct control of the able and zealous officer Mr. James Peniston. The crops mentioned could not be beaten, in spite of the fact that only three months ago the whole locality was dense bush. Already a consider-

able acreage of mealies has been reaped, dry, and sold by a few growers who are more energetic than the rest at 30/- per sack. I am told some have realised £30 and more, and now have a second crop of mealies in the same ground knee high already. When the furrow is completed so far as the boundary line of this Division with Umvoti Division, some 1,200 or 1,500 acres will be under cultivation, and with any degree of success, a shortage of grain ought to be a thing of the past in these thorns. The growing of peas as a winter crop should be encouraged. Oats should not be grown by the Natives, otherwise competition with the European farmer would be the result. This is not desirable. Edibles alone should be grown by the Natives on this ground.

R. ERNST DUNN, Magistrate.

Notice.

LITTLE TUGELA IRRIGATION WORKS.

TENDERS, in duplicate, will be received at the Audit Office, Pietermaritzburg, until noon on Monday, the 23rd day of March, 1903, from persons desirous of tendering for the construction of a Concrete Weir across the Little Tugela, and the digging of about sixteen miles of water furrow.

Further particulars to be obtained upon application at the Office of the Minister of Agriculture.

Any informalities in the completion of the Form of Tender renders it liable to rejection.

The Government does not bind itself to accept the lowest or any other tender, and reserves to itself the right to accept a portion of any tender.

Persons tendering must be prepared to furnish suitable security for the due fulfilment of the contract.

Tenders are to be delivered through the post by registered letter, or by hand, and in the latter case a receipt should be taken from the official receiving the tender.

Tenders are to be addressed to "The Chairman of the Tender Board," Auditor-General's Office, Pietermaritzburg, and are to be marked outside "Tender for Little Tugela Irrigation Works."

C. BIRD,

Principal Under Secretary.

Colonial Secretary's Office, Natal,
2nd March, 1903.

Notice.

LITTLE TUGELA IRRIGATION WORKS.

TENDERS, in duplicate, will be received at the Audit Office, Pietermaritzburg, until noon on Monday, the 23rd day of March, 1903, from persons desirous of tendering for the transport of materials from Frere Railway Station to the Springfield Bridge, Little Tugela.

All particulars to be obtained upon application at the Office of the Minister of Agriculture.

Any informalities in the completion of the Form of Tender renders it liable to rejection.

The Government does not bind itself to accept the lowest or any other tender, and reserves to itself the right to accept a portion of any tender.

Persons tendering must be prepared to furnish suitable security for the due fulfilment of the contract.

Tenders are to be delivered through the post by registered letter, or by hand, and in the latter case a receipt should be taken from the official receiving the tender.

Tenders are to be addressed to "The Chairman of the Tender Board," Auditor-General's Office, Pietermaritzburg, and are to be marked outside "Tender for Transport of Material for Little Tugela Irrigation Works."

C. BIRD,

Principal Under Secretary.

Colonial Secretary's Office, Natal,
2nd March, 1903.

Pound Notices.

THE following stock, unless previously released, will be sold on the 1st April next :—

Pietermaritzburg. — White goat, gelding, both ears cut short.

Moss Dale.—Bay gelding, grey patch on right side of stomach, no brands; bay pony, small white star, shod all round, no brands.

Candella.—Common little black sow, with short tail, very thin; little Berkshire black sow, about 3 months old, all feet white.

Utrecht.—Dark brown gelding, 14½ hands, branded JM on near hip; dark brown mare, branded JU on near hip, small piece out of right ear, 15 hands, has small lump on back.

Nkandhla. Brown mule mare, black points, no marks or brands.

Pomeroy. Running in Umsinga Location, bay mare, black points, long mane and tail, about 142 hands, with bay foal about five months old.

Isipingo.—Running on Coedmore, Bellar, black Madagascarese ox, white head, no brand; damages claimed 30s.

AMENDED POUND NOTICE.

The mule advertised under Government Notice No. 84, in the *Government Gazette* dated 3rd February, 1903, as being in Pomeroy Pound, is, in addition to the brands therein stated, also branded S.H. on off hind-quarter.

Ladysmith.—Dark brown donkey stallion, grey muzzle throat, belly and legs, nup below right eye in front, branded indistinctly on near hip, looks like S above CB, PB on neck, old scar on off shoulder. The above will be sold at the expiry of one month from this

date (21st February), if not previously released.

Colenso.—Six white Angora goats, no brands or marks, all rams.

To be sold, unless previously released, on 15th April next :—

Ndwedwe.—Bright bay mare, about 14.3, black feet, good condition, branded LS (S backwards) on off hindquarter, shod all round, scar on off side of neck, white spots on body, near ear slit; iron grey pony mare, branded (looks like LM) on near hind-quarter.

Estecourt.—Running on A. J. Taylor's farm, "Beaconsfield," ewe goat, ear marks, tip off left ear, half-moon cut in back of right ear.

Charlestown.—Grey mare, branded PG off hind rump; black gelding, branded with four broad arrows in form of a cross near hind-quarter, and triangle in circle off hind-quarter.

Impendhle.—Running on the farm "Brentwood," bay mare, notch near ear.

Woodstock.—Three Kafir sheep, two ewes, and one ram; one ewe marked with two winkelhaaks on right ear, and slit in left ear; one ewe marked with three winkelhaaks on left ear.

Estecourt.—Red bull (Zulu), is branded on left hip IB, has two holes in dewlap, also a white patch on hind leg, round horns, probable value about £10. The above animal will be sold at the expiry of one month from this date (28th February), if not previously released.

Woodstock.—Dun bull, tip off left ear, slit in left ear, winkelhaak in right ear, probable value £10. The above animal will be sold at the expiry of one month from this date (25th February), if not previously released.

Green Bone as an Egg Food.

LEADING authorities agree that green bone is the best egg-producing food known. It is not an artificial stimulant like some preparations which force hens to lay for a time. On the contrary, it is food which contains every element necessary for the greatest number of healthy nutritious eggs. A powder which merely forces the hen to lay cannot add to quality, and it is merely a question of time when the fowl will break down under the drain on the vital forces. Many

poultry keepers have killed fowls through ignorance of scientific feeding by this forcing process. They killed the goose that laid the golden egg because they did not understand the laws of production. What is wanted is a thorough knowledge of the food that makes the most eggs, for a healthy hen with a full supply of egg material must by Nature's laws become a steady producer.

Green bones—that is, bones fresh from the butcher—cannot be surpassed as

poultry food; they are easily procured, are much cheaper than meat, and contain a larger proportion of the elements that enter into the composition of eggs than any other material, as they are more concentrated. Ground dry bones have long been on the market as poultry food, and they have served the purpose intended; but while the poultrymen and farmers were resorting to the use of dry bones, they also witnessed the waste of much better and far more valuable food every day, in the shape of more nutritious, more digestible, and more highly-relished fresh green bones, simply because there was no method known by which the tough green bones could be reduced to a condition to render them acceptable to poultry. But with the advent of the green bone cutter, all of this valuable material can now be made to form a portion of the food for poultry. The old-fashioned bone mill grinds the hard, dry, brittle bones, but it is unserviceable in reducing green fresh bones, as green bones cannot be ground; the modern bone cutter, therefore, has come to supply a long-felt want, and ought to be extensively taken advantage of. These appliances can be obtained from several firms in Perth, and repay their cost without the least difficulty.

What is the difference between the green fresh bones from the butcher and those that have become hard and dry? Though the comparison of a green bone with a dry bone, side by side, will show there is a difference, yet an explanation is not out of place here. The green bone contains the natural juices (the water being solvent) and upon evaporation the bone becomes very light. By weighing a fresh bone and weighing it again when it is very dry, the difference will be found astonishingly great. The green bone contains meat, blood, gristle, oil, and mineral water in soluble condition. Upon exposure to the air not only does decomposition occur, but the chemical changes are such as to rearrange the particles of the bone itself. All animal substances, upon decomposition, are finally converted into ammonia, which is volatile, while the evaporation of the water not only liberates all gaseous formations, but permits of

chemical changes which convert much of the soluble material into that which is insoluble. The green bone, though tough, is soft compared with the dry hard bone. Insects also clear away from the bones all that is unaffected by exposure to the air, and in place of the juicy, succulent green bone, rich in the phosphates, nitrogen, and carbon, we have the hard, dry, insoluble bone, brittle and bleached, and composed of but little more than phosphate of earthy matter, all of its real nutritious matter having passed away. The natural solvent cannot be regained or replaced.

The value of all foods depends upon their digestibility. The green bone, containing its natural juices, is digestible, especially by birds, and when in a very fine condition it is also digested by animals, because its particles are less dense; but the dry bone, having lost its solvent agent, has become harder, its particles rearranging closer together, and is only slowly digestible, if at all. Bear in mind that it is not the amount of food eaten that gives the best results, but the amount digested. Nothing will make a chick grow as rapidly as will green bone—in fact, the growth seems marvellous. The object of this is to impress upon all who keep poultry the necessity and importance of utilising the waste materials. Eggs are always cash on the market, and especially in winter, while bones are more plentiful in winter than are some other valuable materials. The bone cutters are labour-saving; they permit the use of valuable bone, and they pay back their cost in a short time, so that their use just now is almost a necessity.

The fresh bone serves a special purpose, for it contains the materials for the white of the egg, the yoke, and the shell all in a concentrated form, and in a partially soluble condition; while the dry bones will remain untouched—that is, as long as fresh bone is supplied. The cheapness of bones is another factor to be considered, as they can be purchased very cheaply from the butchers, and the improved bone cutters will render them valuable and convert them into the most desirable of all foods in a very short time.

—Exchange.

Settlements for Immigrants.

AT the annual meeting of the Inanda Agricultural Association, held on the 18th ult., Mr. Leonard Acutt delivered an address upon the provision of small settlements for European emigrants. He said, *inter alia*:—

We have in some particulars more favourable conditions for farming than other parts of the Colony, or, indeed of South Africa, the main one of which is that our rainfall during the time that annual crops are growing is more certain than that of any part of Natal, and such a thing as a total failure of our Coast crops is unknown. As regards climate, we are, of course, somewhat at a disadvantage compared with up-country. Still, I contend that ours is a climate in which a white man can do field work. We have only to point to our Indian farmers' holdings to show the capabilities of our soil, and that not only in picked spots, but almost, it might be said, taking the land as it comes. If, then, it be granted, as it must be, that we have, as regards soil and climate, suitable conditions for farming, it only remains for the Government to do what is necessary to foster a farming population, and to evoke discussion on the subject. I now beg to offer my views.

LAND.

Naturally, there being practically no Crown lands on the Coast, land will have to be acquired. Such land should not be more than six miles from a railway station. At this distance a man can, with a cart and horse, go and return to the station in half a day, and, if he meets with bad weather, he has something to spare. I regard the further distance as a serious handicap, that is, where the distance is such that it requires a whole day for a trip to the station and back, under favourable circumstances, and, if anything goes wrong, it means a night on the road.

LABOUR.

One of the great objections I have met with in discussing this matter of the introduction of farmers has been the question of labour. Now, I would say that, while not debarring the men settling from applying for indentured Indians, or employing kafir and free Indian labour, I look to the settling of a class of men on the land, who, with the aid of animals and labour-saving implements, will be, in the first instance, independent of indentured labour. Labour has been fairly plentiful with us on the Coast, but we are now feeling the pinch, and shall have to economise, and we have little or no idea of the extent to which we can make use of implements, when labour once begins to get permanently scarce.

CLASS OF LAND.

In view of the necessity for the use of labour-saving appliances, I look at land differently to what I should do were coolie labour to be used, and I think it quite possible, but I do not say that I am certain on the point, that what have been considered, and undoubtedly are, our poorest lands for land cultivation, and without the use of manure, may prove, under implement culture and the use of fertilisers, quite as profitable as our strong chocolate and red soils. For why should we not find this the case here as well as they have found it up-country, where now may be seen thousands of acres of land under crops, which not so many years ago was considered too poor to grow anything, nor would it grow anything without fertilisers. However, the cost of such manures is considered to be more than counterbalanced by the manageability of the soil which is always workable, and can be ploughed and cultivated the year round, or nearly so, and the cultivators can always be worked: whereas, a few years ago, on what were considered the best lands, limited areas of bottom lands, it was nearly always too wet or too dry for the ploughs to work. We have got stretches of such lands on the Coast, and it is on these that I think farming would have a chance.

CLASS OF SETTLERS.

I would first, near any centre of population, give small holdings on easy terms to families, some of the members of which could earn money for work among the present farmers; these, of course, would be limited in number, as there would only a certain amount of work to be done in each district, but the total would come to a good number, and be an addition to the sparse white population. I cannot doubt that many families could be settled in this way with every chance of success.

GOVERNMENT AID.

Besides direct aid to the farmer, the Government must establish experiment stations, from which bulletins would be distributed free to farmers. The growing of sugar cane would probably soon become popular, and an arrangement could be made at first with the existing factories to purchase by weight for cash sugar cane in any small quantity, but, later on, a Government sugar factory would be a necessity.

CROPS.

I cannot go into estimates in detail, but I think if two or three men, or a family with a little capital, took up an allotment with, say, 50 acres of land prepared, as I have pro-

posed, with mealies as a main crop, with poultry, pigs, small fruits, tobacco, etc., the result of even the first year should be satisfactory. One good horse or large mule should do the bulk of the work of, say, 40 acres of mealies. The use of fertilisers on the lands I have described would be imperative from the outset, and any estimates must include a liberal sum per acre under this head.

FAILURES IN THE PAST.

It will be said that any attempt to settle men on the land will meet with the same failures as befell past attempts. To this I reply that the circumstances at that time were different; there were then no roads, no bridges over rivers, and no market for produce when grown. To-day we have running the whole length of our coast lands a railway which at slight cost will market anything we produce.

Mr. G. H. Hulett followed with a reply to Mr. Acutt's address. He said:—The first question is, can a white man work in the field with a hoe, during the planting season, which is the summer. In other words, will it be possible to get a white man, his wife, and, say, one son, to cultivate 20 to 30 acres of land, as the Indians do? I say unhesitatingly, he cannot do it. I, for one, would be very sorry to see a white man attempting it, as he would have to reduce himself to the level of the coloured man, in order to make a living at it. I would rather see no increase in the white agricultural population, than a poor white class, that you have in some parts of the Cape Colony. The white man is to be the ruler, and as such must be socially a good way above the black man. On the other hand, I agree with Mr. Acutt in thinking that, with labour-saving appliances, and land suitable for the working of such appliances, a white man could do a great deal more than an Indian, or Native, with a hoe. I also agree with Mr. Acutt in thinking there are such lands to be found on the Coast, and especially in Victoria County. I will mention, first, many portions of the farms Compensation, De Jager's, and other lands round Umhlali—lands near the Lower Tugela, all within easy distance of the railway. I think, however, 50 acres is too small. It should be nothing under 100 acres, and in connection with each settlement a commonage of about 1,000 acres of land should be laid off for use of the settlers as a common grazing ground. I have already said I do not want to see white people brought into the Colony for the purpose of merely existing. I want a person who can, from his allotment, earn sufficient to keep himself and family comfortably by making from £150 to £200 a year, exclusive of rent. If he has to cultivate any of the Coast products he must have assistance at certain periods of the year, such as harvesting time. In England and Canada, a class of labourers is drawn from the town to assist.

The question which arises here is: Can that class of white labour be got here? I say no. You cannot get a man for 3s. or 4s. a day with food and lodgings, and you cannot afford to give more, therefore, I contend a certain amount of coloured labour must be available. I see no reason why the settlers should not get assistance from the Government in obtaining such coloured labour. If it is right to assist them to get land, horses, tools, etc., why not the labour that is absolutely necessary? If labour cannot be got in the Colony, then it must be got out of the Colony, or else abandon agriculture altogether. The settlement of European agriculturists on the Coast lands of Natal, especially in the Zululand Province, is not impracticable, and certainly should be exempted. The Government should move at once. Other parts of South Africa are offering inducement to settlers, while the Government of this Colony appears to be asleep. Fruit culture, I believe would be one of the best things; a body of settlers could go in for. Under the direction of such a man as Mr. Fuller, this industry is capable of expansion, and of being made very profitable.

In the course of the discussion which followed,

Mr. S. W. Bishop said there were points in both speeches with which he agreed and others with which he disagreed. As to whether white men should be placed on an equality with the Indians, by working their own land, it occurred to him that many of the first men in the Colony were men who had started at the bottom of the ladder. The great difficulty to his mind, was how to get the land for the settlers. If suitable land could be secured near the railway line, the prospect could no doubt be carried out successfully. If it were not for the present high price of land, he quite agreed with what Mr. Acutt had said.

Mr. Allkins said a man who settles in the Colony would want a house to live in, horses and mules to work the farm, and other necessities. All that meant money. Years ago animals were cheap; they could run where they liked, and nobody interfered with them. That was all done away with. A man who settled in Natal now would want a fairly large capital, and he would have to wait some time for a return. Then, how was he to get labour? The fact was that neither the white men nor their wives would do this class of work. The tendency in Natal was the same as it was in England—the population tended to drift towards the towns. The great centres of population in South Africa would appeal strongly to the white man, who would naturally look to the gold fields as a substitute for his somewhat precarious income on the land.

Mr. F. Rathbone said he was afraid that the small farmer would not under the circum-

stances do well at first. He would have to pay for his land in instalments, and those would probably run away with a great part of his income for the first year or two. He agreed with the two previous speakers, that the main difficulty in the way was the high price of land.

Mr. W. Campbell said that if the farmer in Natal could irrigate his land, he saw no difficulty in the way of his making a fair income.

Mr. C. Townsend said one of the first questions they had to ask themselves, was: Could they possibly get the right kind of man for the purpose which Mr. Acutt had discussed? If they could, he thought there was absolute certainty of some good coming of it. Markets were much better than formerly, and market and poultry produce now paid wonderfully well. What was wanted was a population composed of men who would be prepared to do rough farm work, and not look too much for assistance from outside.

Mr. Starr agreed with Mr. Allkins, that the great difficulty was to be looked for in the high price of land. In the present state of affairs, he was afraid it would be very hard competition for the small farmer with the coolies, who populated the Coast districts in such large numbers. He did not see what the settler could grow with the exception of the annual crops, in which the coolies already had a large proportion of the market.

Mr. A. Townsend said it would be a great mistake to look too seriously upon the drawbacks which had been mentioned by the first two or three speakers. He did not see why the man could not handle a hoe or a spade in the sun. It was his opinion that the kafir would respect him for doing so rather than otherwise.

Mr. C. Jackson followed in the same strain. He believed a white man could work down a black man every day of his life. He suggested that the project should be shelved until Zululand was taken over. Then they could secure a large quantity of good fertile land, easily workable, at a reasonable price.

Mr. E. Saunders said if it was possible to obtain a more rigid system of land taxation upon the absentee landlord, the difficulty would be solved. Instead of land standing at £8 or £10, its value would drop to a reasonable value, according to its capacity for production, for the landlord would be only too ready to leave it. The only remedy was a good tax. They should leave all the other difficulties alone until they had settled that of the high price of land.

Mr. Acutt, in replying to the various criticisms, said with reference to the question of land value the Government had passed an Expropriation Bill, and were now entitled to take over land at a valuation. There was no reason why, under this provision, the Government should not take over land at say £5 an acre, and sell it to a settler at less. As regarded animals, two good mules and a horse

would be quite sufficient for a fair-sized farm. The Government might advance money for this purpose, and might also provide a house for the settler. The farmer should have nothing whatever to do with cattle. If it were necessary, why should not the settler who took up land be rationed for twelve months? No such petty consideration as this should be allowed to stand in the way. He believed, however, that the majority of men who came out would have £200 or £300 of their own, which would keep him going for the first year or two; for they must remember that it was more easy to get men with money to emigrate than it was 50 or 60 years ago. He knew there would be difficulties, because no doubt some men would settle and would soon get disgusted, but out of ten men one or two were sure to stay and other men would take up the land that was still left. He moved the following resolution: That this meeting approves of the establishment of European settlers on the Coast lands of the Colony, and believes that such settlers will meet with a fair measure of success if they are wisely aided by the Government; and expresses its willingness to assist Government in any way possible.

The resolution was seconded by Mr. G. H. Hulett, who said he did not want to see in the Colony a pauper white population. He had no fear that the white man would not work, but it would not do if by his undertaking the more menial labour about the farm he reduced himself to the level of the kafir. The whites were the ruling class, and it was necessary to maintain their prestige.

The resolution was carried with two dissentients.

According to Mr. J. O. Armour, of the great Chicago meat-packing firm, the best estimate of the world's total herds and flocks shows that there are 310,000,000 cattle, 600,000,000 sheep, 100,000,000 hogs, and a possible 70,000,000 goats, or a total of 1,080,000,000 edible live stock in the whole world to feed its estimated population of 1,500,000,000 people, of which 800,000,000 are semi-civilised grain-eating Asiatics, and 450,000,000 North Americans and Europeans.

Much time and water and work are wasted watering plants, while these get little benefit by watering or spraying on the surface, when, unless a thorough drenching is given, which is seldom done, the moisture is often soon evaporated or fails to sink through the dusty surface. By sticking four empty bottles head downwards round a tree and pouring water in a hole punched in the bottom, the water gradually percolates into the soil below the surface and spreads around. Old tin cans with small holes punched in the bottom can be used. In the country we used bamboo joints, and thereby save much time and labour, and waste, in establishing young fruit trees in dry weather.

Paspalum Dilatatum.

PROPAGATION.

A FEW general instructions as to the method of propagating *Paspalum dilatatum* plants and transplanting them into paddocks.

By TEMPLE L. FVIE.

This grass seed takes a long time to germinate. It requires about three weeks of continual moisture and warmth before it sprouts, therefore I consider it safer, in our dry and uncertain climate, to plant in comparatively small and well prepared beds, and afterwards to transplant into permanent paddocks.

I have gone into rather minute detail for the sake of those who know next to nothing of the correct way of planting small seeds.

(1) Plant seed in fairly rich soil, well prepared as for ordinary garden seeds.

(2) Plant in rows about six inches apart, furrows to be made with light stick, and not to be deeper than about $\frac{1}{4}$ of an inch. Planting in rows is preferable to broadcasting for many reasons. The correct plants are more easily discernable, and can be weeded with greater facility.

(3) Seed to be sprinkled fairly thickly in the miniature furrows, then covered over lightly with fine soil, and firmly pressed down.

(4) Cover bed over with a light sprinkling of grass or litter, so as to keep sun from baking a hard surface.

(5) Keep continually moist by artificial watering (if weather allows beds to get dry) until seeds germinate. After the

plants are about a month old, they can stand a considerable time without water.

(6) Seed, under favourable conditions, may be expected to germinate in about from 14 to 21 days. When it first breaks the ground it will appear in needle-shaped points, and just where it joins the ground will be noticed, by looking closely, a reddish brown band about the breadth of a thick sowing needle.

(7) If planted early in September, and fully exposed to the sunlight, these plants will, or ought to, be nice and strong for planting out in, say, December.

(8) If planted in March, plants may be left in the beds during the winter months, and ought to be in first-rate condition to plant into permanent paddocks, say, after the first early spring rains, or whenever convenient. Planters can please themselves as to the distance apart they put the plants, but I would recommend three feet apart each way.

(9) When roots are dug up for transplanting they can be divided up into pieces about the size of a man's little finger. Roots to be trimmed to remain about two inches long. Top blades of grass to be cut so as to make full length of plant about ten inches or so.

(10) If ground is thoroughly moist at time of planting, and the planting is done with any degree of care, about 90 per cent. of the roots will strike, even if no rain falls within, say, two or three weeks after planting.

(11) The older the plants are the more rough usage and drought they will stand in transplanting.

Overstocking and Forest Denudation.

IN a bulletin (No. 44) issued by the Arizona Agricultural Experiment Station on the river irrigating waters of Arizona, the disastrous effects resulting from overgrazing by stock and the destruction of timber in mountainous coun-

try are vividly illustrated. The most important water supply is from the Salt River, which is formed by the junction of two rivers—the Salt and the Verde. Above their junction the two rivers are of equal length, about 170 miles, but the

area of the watershed of the Salt River is 6,260 square miles, against 6,000 square miles of the Verde, while the elevation of the head waters of the two is 8,000 to 9,000 feet and 6,000 to 7,000 feet respectively. The contour of the watershed of the Salt River is more precipitous than that of the Verde, and the rainfall at the head waters in 1898 was 20.6 in. and 13.1 in. respectively, the character of the rainfall being generally similar but distinctly heavier at the head waters of the Salt River. The annual discharge of water in the Salt River is naturally considerably more than that of the Verde, *i.e.*, 37 per cent. greater. With practically equal length and drainage, but with a steeper watershed and a much heavier rainfall, the Salt River should be expected to deliver higher floods as well as a greater amount of water; but this is not the case, the heaviest floods in most instances coming down the Verde, and the rise and fall of the water in the latter river is much more abrupt than the Salt River. The conditions of the watershed alone can account for the more rapid drainage of the Verde. Originally the country tributary to the rivers was similar, the higher mountain slopes and tablelands being forested and the foothills and valleys covered with grass. The upper watershed of the Salt River remains in nearly primitive condition, while the Verde country for thirty years has been grazed with sheep and cattle, and has supplied timber for mines and sawmills, with the result that the water rushes away more rapidly and carries off considerable quantities of silt; in fact the overgrazed and lumbered districts of the Verde are stated to have washed badly of late years. The difference in the character of the two streams at their junction is also shown in the following table:—

PERCENTAGE OF WEIGHT OF SILT IN THE
SALT AND VERDE RIVERS.

	1901.	Jan. 1-31.	Feb. 1-15.	Feb. 16-28.
		per cent.	per cent.	per cent.
Salt River	·026	·053	·012
Verde River	·0469	·0874	·1569
	1901.	Mar. 1-31.	April 1-18.	
		per cent.	per cent.	
Salt River	·0099	·00021	
Verde River	·024	·00033	

Another Arizona river—the Gila—shows the effect of overgrazing on the

character of its waters in a marked manner. Originally 90 per cent. of the watershed consisted of open grass-covered country, which has been for years so heavily stocked that the grasses have everywhere been depleted, and in some parts practically destroyed. The rains, coming upon these bared and trampled ranges, fall with but little obstruction into the watercourses, giving rise to sudden and violent floods of great erosive power, which carry off enormous quantities of salt. The Gila River is said by the residents to be one of the muddiest in the world, and tests justify this statement. In flood time the quantity of silt has reached a maximum of 9.41 per cent., and a local farmer vouches for the statement that four bucketfuls of water, on being evaporated, left behind a bucketful of silt. The water from the river turned into a basin 300 feet long, 36 feet wide, and 1½ feet deep completely filled it with sediment in three weeks.

Peruvian or Guzco Maize.

THE trials of this wonderful corn made in other parts of the world have not been successful. In South Africa the seeds have entirely failed to produce cobs. In different parts of Australia poor results have been obtained. But all these places have very different conditions to its native habitat, which is at a good elevation in the Andes, 7,000 and 8,000 feet. This nearly corresponds to 3,000 to 4,000 feet here. This corn grows to a great height, 20 feet and more, in situations it finds suitable.—*The Journal of the Jamaica Agricultural Society.*

In 1856 the first mechanical contrivance for milking cows was invented in America. The *Gentleman's Magazine*, which heads its description "Curious if True," says: "The milking is done by means of a crank attached to a shaft, on which there are four elastic arms of steel, the ends of which are furnished with rollers. On one side of the ring, within which the rollers move, there is an elastic pocket into which the cow's teat is placed. The back of this pocket is stiff, so that when the rollers revolve they come in contact with the front part of the pocket, and press it with the teat against the back part. The teat thus pressed is relieved of its milk, which flows down through the pocket, and through the hollow case of the instrument, into a tub. The size of the machine is convenient, and its cost not great."

Collar Rot on Orange.

By CLAUDE FULLER.

COLLAR ROT of orange trees is common throughout the Coast belt of Natal, and is found inland up to elevations of 3,500 feet. Above this level the fruit is not extensively grown, and no cases of collar rot have come under observation.

Collar rot is known by various other names, such as mal-di-gomma, root rot, yellow leaf disease, and gum disease. Of all these, Collar rot is the most applicable term for the various cases which have come under observation in Natal, because it expresses exactly the phase of the disease noticed locally.

The terms mal-di-gomma and gum disease are synonymous, and refer to the exudation of gum on the trunk of the tree, which marks the first stage of the disease. Such gumming is, however, very rare in Natal. The terms root rot and yellow leaf are only partly applicable, because, whilst the yellowing of the foliage does accompany collar rot, it is not necessarily a true symptom. Root rot is only partly applicable, because the root system in our typical cases of collar rot is not necessarily rotten. Furthermore, I believe that I have located a form of citrus trouble to which both terms root rot and yellow leaf are more applicable. This is in the case of trees whose root system becomes fermented and rotten through the condition of the soil, particularly in the case of trees in a "water-logged" soil. The yellowing of the foliage is a striking indication of a stagnant or poisonous soil.

Collar rot in Natal occurs under very diverse conditions of soil, and, whilst the occurrence of bad drainage may occasionally be detected in many cases, it is impossible in others to attribute the disease to such a cause. As illustrating this point, I may mention the following cases:—

One, near Stanger, elevation 200 to 300 feet above sea level, soil dry, dark, sandy loam, and somewhat gravelly; situation, a small hill-top gently sloping; a large

variety of garden plants and trees, including euclypts, doing remarkably well; affected trees, seedling oranges, 20 to 30 feet high, bearing large crops, about 20 years old; collar rot apparent for a few inches above ground; no gumming; said to have appeared three years ago, and thought by owner to be due to a dry season.

Two, near Verulam, elevation 200 to 300 feet above sea level, soil dark, lying over broken shale, with which it is mixed to a depth of 2 feet; situation, steep hill-side; affected trees, seedling oranges, 3 to 4 years old; collar rot just apparent 2 to 3 inches above surface; roots strong but all showing scars typical of the disease, generally looking as if gnawed previously by insects and healed up (callused) around margin; no gumming; recently apparent and trees succumbing. In the case of one tree uprooted and examined carefully, the writer noticed that one of the early lateral roots of the tree, one of the first to grow after transplanting, was quite dead, and it is concluded that it was through this root that the disease entered the tree.

Three, on the Umzimkulu River, 40 to 60 feet above sea level; soil alluvial bank of river; situation of diseased tree, about 100 feet from river edge, growing in an avenue of 50 or 60 trees on either side; tree half way along in row furthest from river; 20 feet high, 12 years old, seedling orange; condition almost dead, collar rot just apparent, rest of tree sound, remaining trees in avenue quite healthy, except one tree growing next to that diseased, which is apparently quite sound, but carries a large limb with yellow foliage. Trees have never been pruned.

Four, on Umzimkulu River, about 700 feet above sea level, on windy side of hill; soil lying over sandstone, black and sour looking with such grasses as indicate sour soil, dry and with good natural drainage; affected trees, old seedling oranges. In this case the trees have coppiced from old

stumps, the cutting having been crudely done and the heart wood of the trees all dead. In this case the disease might be traced to the adverse natural conditions and the bad treatment they had received.

Five, near Maritzburg, elevation 3,500 feet above sea level; soil red sandy loam, situation hill-side with good natural drainage; affected trees, seedling oranges and mandarins and oranges on lemon stocks, 15 to 20 feet high, age 10 to 12 years; collar rot apparent a few inches above ground; general conditions good. Disease has been present for some years, and trees gradually failing. The only adverse condition noticed by the writer is that the trees appear to have originally been planted too deep or else the soil has gradually accumulated to too great a depth around them.

Six, near Maritzburg, elevation 3,500 feet; soil dark loam, on flat upon hill-side, natural drainage good; affected trees, old seedling oranges (over 20 years), 25 to 30 feet high, growing closely together

and shading a back-yard, soil compact and uncultivated. Lateral surface roots well out of ground and much bruised. Typical collar rot extending several feet up trunk. Only three or four trees out of about 20 are affected. The disease is said to have been present for some time, and the affected trees are in fair vigour.

Seven.—A large number of seedling oranges growing at an elevation of 900 feet above sea level; soil light sandy loam lying over sandstone, natural drainage good, situation sloping hillside; trees about 10 years old, 15 to 20 feet high, good croppers and well cultivated.

Many other cases have come under observation, but in these the drainage has always been faulty and the trees generally sweet oranges on common rough lemon stocks.

With these cases in mind, we may now consider the investigations and observations of those in other countries.

(To be continued.)

Local Oil-cake.

WITH reference to enquiries from several dairy farmers as to local oil-cake, the following information has been procured.

Until 1898 cake was produced from ground nuts obtained from ports of the tropical East Coast by Messrs. Moosa Hajee, Kassim, of Durban. The industry was then abandoned owing to the heavy duty, which amounted almost to the original value of the nuts.

Mr. A. H. Galloway, Malvern, produced the cake from nuts of his own growing. He has been good enough, in reply to a request for information, to write the following:—

I am afraid anything I can tell you about oilcake will be ancient history, for it is some years since I gave up making it.

The results in the mill were quite satisfactory, both oil and oilcake being all that could be desired, but the yield from the field I found disastrous. The native

ground nut, or *Arachis*, appears to give a fairly regular crop, but is far too expensive to reap. The imported or South American variety can be reaped at about one-fifteenth of the cost of the native, but is a much more delicate plant, and a spell of dry weather during any of its life of four and a half months spoils the yield altogether. At any rate that was my experience, and I planted it, I think, for seven years.

I found the cake gave splendid results with my cattle. I had nothing but the ordinary Zulu cows, and my experience was that two to two and a half pounds a day would keep a milch cow fat and in good condition and increase the yield of a five-bottle cow to eight bottles of very much richer milk. I am unable to say how this proportion would show in a better bred cow and a good milker.

I never had any fault found with the quality of the cake, and was several times

told that it was as good as the best imported linseed cake.

The only warning that a novice in feeding the cake should be given is, that it must be previously soaked, as it swells

enormously, and for that reason it is injurious to give it dry.

My impression is that the Trappists at Mariannhill still make the cake, but I do not know in what quantity.

Fruit Notes.

MRS. H. E. KIRBY, of Klipfontein, Highlands, sends the following:—

To those, perhaps, who appreciate the several advantages of grafted trees over seedlings, and the benefits of pruning, it will be interesting to hear that at Bird Spruit Farm, in Weenen County, there were seen last month some seedling peach trees, Red Clingstones, in full bearing. Considering the season, the fruit was not only good-sized but of nice flavour. Now, these trees are thirty-five years old, and are not only ungrafted, but have never been touched by the pruning knife; and they have been bearing annually not an uncertain crop but readily good fruit of even quality and in large quantities.

Those who are scientifically studying the question of the respective merits of seedling trees and grafted and the necessities of pruning would possibly be able to give reasons for the constant bearing and good and true crops of these trees.

Some considerable time ago there appeared an article written by a farmer to the "Farmers' Column" in the *Times* saying he had cured the blight on apple trees by the use of Cooper's Sheep Dip. I had six Japanese plum trees which were blighted with an insect, a black ant in

resemblance. After the sheep had been dipped, I myself took a can and watered the trees with some of this Cooper's Dip, and the result was, I killed not only the blight but the fruit and trees as well. The trees were thought to be quite done for, but are now found to be gradually recovering.

After this experience, I have come to the conclusion never to attempt the use of Cooper's Sheep Dip again on plant-life.

According to the *Agricultural Journal* of February 6th, Mr. Harwin Pepworth seems to have been disappointed in the promise of fruit given by a plum tree of the Japanese variety.

I have a number of plum trees, some in the first year and others in the second year of bearing, and, as far as regards bloom, they were on a par with that shown by Mr. Pepworth, but they did fruit, and quite in accordance with the promise of the bloom. They belong to the Satsuma, Burbank, Kelsey, and Abundance varieties.

The trees bore so abundantly that they had to be supported. More than two large baskets have been filled by three of the Burbanks alone, and some of the trees are still laden.

Labour Contracts.

LUJI and six other Natives, who are tenants of Fred. Symons, of Glenbella and Alma farms, sought a revision of the decision of the Magistrate for the Weenen Division (Mr. R. E. Dunn), who, on January 12th, gave judgment against the appellants for £28 damages in respect of a breach of contract. It was alleged by the respondent that the appellants, as tenants, entered into a contract to pay £3 per hut per annum, and also to supply labour during the fruit season, etc., at 1s. per day.

The main grounds of the appeal were that the nature of the contract was not properly explained, and that the appellants did not undertake to supply labour. It was also as-

serted that Clause 7, upon which the claim for damages was based, was void by reason of the uncertainty thereof.

Mr. T. Hellett was for the appellants, and Mr. C. Miller for the respondent.

After hearing argument on both sides,

The Bench amended the Magistrate's judgment by reducing the damages from £28 to £21.

Mr. Justice Beaumont said it did not seem to him that any Court of Law could enforce such a contract, and he therefore disagreed with the majority of the Bench.

The parties were ordered to pay their own costs.

Paspalum Dilatatum.

To the Editor Agricultural Journal.

DEAR SIR,—My letter of a week or so ago on *Paspalum dilatatum* has drawn down on me a host of enquiries as to the best methods to adopt in laying down paddocks of this valuable grass. I have answered a good many of these enquiries by letter, but, as they still continue to roll in, I will, with your permission, answer the rest through the columns of your valuable journal. I dare say there are many others in the Colony who will also be glad of the information. Of course, I do not pose as an authority for a single moment, but I have planted out some hundreds of thousands of plants, and I have read up everything I could lay my hands on that had any bearing on this matter. I have taken a keen interest in studying the valuable characteristics of this grass, and therefore can speak with some little authority. I herewith enclose a list containing full instructions of what I consider the best way of planting, etc. Many of the enquirers have also asked me to advise them as to what manures to use. This is rather a "tall order" and one that I am not qualified to advise on scientifically.

Perhaps it will help some of them if I give a few general principles on the science of manuring.

The three principal constituents of the soil that generally need to be added artificially are "Phosphoric Acid," "Potash," and "Nitrogen." These three are, I believe, given in the order of their importance in most Natal soils.

Generally speaking, all our pasture lands require Phosphoric Acid more than anything else, and all, or rather most, light sandy soils are supposed to be deficient in Potash. Nitrogen is also of great importance, but as this constituent is drawn from the air by leguminous crops, is brought to the earth by rain and dews, and is also absorbed from the atmosphere by moist earth, a great many soils have a fair quantity of Nitrogen. Moreover,

Nitrogen is a very dangerous plant food to over-manure with. If the land is not well supplied with the other plant foods, one could easily ruin a field by supplying too much Nitrogen. This is caused by the forcing effect of this latter manure.

Plants would be forced to grow at a great rate, and, through not having a good supply of other plant foods in the soil, would be delicate and peculiarly liable to disease, and without much vigour or stamina.

Lime is also notoriously deficient in all Natal soils. I believe the best two sources of Phosphoric Acid at present on the market are "Superphosphate" and "Basic Slag." It is dangerous to use the former manure on damp lands inclined to acidity (through lack of lime, or superabundance of vegetable matter), but is a first-class manure (of course, used in conjunction with other manures), on light soils free from acidity. Basic Slag does well on, and is peculiarly adapted to, lands inclined to be damp, and of a peaty and organic nature. The lime contained in this manure tends to correct any acidity there may be in the land.

This acidity is, of course, inimical to plant growth. Potash is supplied by various manures on the market. Kainit is favoured by some, as the common salt which it largely contains is supposed to be of value to certain lands. Other authorities aver that the salt is of no agricultural value. "Muriate of Potash" and "Sulphate of Potash" are two other high grade potash manures. Opinions differ very much as to which of the above manures are best to use, but, of course, this question is largely governed by the distance one happens to be from the railway.

If a long wagon journey has to be made, the higher grade manures would be the best to go in for, providing, of course, that their value per unit more or less agreed. Many soils are naturally rich in

potash (generally in heavy and clay lands). On these lands any money spent on potash manures would practically be thrown away. Farmers must aim at getting a "well balanced soil," that is, containing the proportions of the several constituents necessary for the growth of whatever particular plant is to be cultivated. The importance of this cannot be over-estimated, for, laying aside the probable damaging effect a preponderance of one constituent may have, that amount of manure is practically lying idle, and represents so many sovereigns buried in the land.

I forgot to mention in my last letter that I planted in the same paddock with my *Paspalum dilatatum*, Johnstone grass, white clover, and cocksfoot. These three grasses are still alive, but are making practically no growth. The drought still continues unabated. My farm is assuming the aspect of a desert, but, in spite of it all, my few acres of *Paspalum dilatatum* continue to flourish!

In conclusion, I will give a "tip" which I think will prove of great value to many farmers, and that is to plough up the lands they wish to lay down to grass during the autumn (of course, manuring well), and next spring put in a crop of mealies;

when mealies are about three feet high transplant thin *Paspalum dilatatum* in amongst the mealies. The mealie crop under normal conditions, will more than repay for the cost of ploughing, manuring, cultivating, etc., and the planting out of the grass. In this way, one can lay down a paddock which will prove of great monetary value without being out of pocket, and possibly come out with a good balance in hand.

I myself have been extremely unfortunate. I planted out about 200,000 plants some few weeks ago, and ever since then we have had hot scorching weather, without a drop of rain. Many of my "cherished" plants are already dead, and I am afraid the others will not last much longer in this heat and drought. I marvel that any of the plants are alive. It speaks well for their vitality to be alive at all. However, it all gives experience and variety, so I must find out the lesson it teaches and try to benefit by it. It is a hard lesson nevertheless, and one which I would like to do without. Trusting that this letter will interest at least some of my brother farmers, and thanking you in anticipation, I remain, yours faithfully,

TEMPLE L. FYVIE.

Faldon, Fawn Leas.

Agricultural Shows.

Himeville, Friday, 3rd April. Entries close 16th March; late entries 2nd April. Henry C. Gold, Hon. Secretary.

Greytown, Thursday, 14th May. Entries close 25th April. President, A. Kohrs. W. H. Gibbs, Hon. Secretary.

Bulwer, Thursday, 28th May. Entries close 9th May. President, J. F. Alexander. Hon. Secretary, A. Brown.

Estcourt, 3rd and 4th June, 1903. President, H. Blaker, J.P. E. Cauterley, Hon. Secretary.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries close 4th June; late entries 11th June. President, Sir T. K. Murray, K.C.M.G. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President, A. W. Cooper, J.P. Hon. Secretary, John Marwick.

Mid-Illovo, Thursday, 5th August. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

The Natal Creamery average test for February was 4.5.

The Dairy Herd: Its Formation and Management.

(Concluded.)

ABORTION AND MILK FEVER.

In herds the best regulated and cared for there will occasionally occur a physical accident or some sudden fright which causes a cow to prematurely drop her calf. The herds should be constantly watched for symptoms of abortion, which will generally be recognised by the experienced herdsman. Should such symptoms appear the suspect should be immediately removed to hospital until the case is over or the signs disappear. In case abortion occurs in stable, yard, or pasture, despite precautions, and wholly without warning, as is sometimes the case, take the animal to hospital at once and use every exertion to thoroughly clean and disinfect the place where the accident occurred. The aborted cow should be carefully nursed and the genital organs freely dressed with antiseptic solutions. The animal should not return to the herd until fully cured, clean, and free from all vaginal discharges. Be on guard for a second case following the first in a few days or within three weeks; if a month elapses recurrence is not to be expected. Veterinarians recognise two distinct kinds of abortion, viz., the *sporadic*, which is first mentioned above as resulting from accident, physical injury or fright, from disease of the uterus, or from "sympathetic" influences, and the *epidemic* or *contagious*, which is undoubtedly a germ disease, communicated from animal to animal by the germ, and caused only by contagion. There is still much uncertainty about the dread disease and its prevention.

Milk fever, "dropping," or parturient apoplexy, is another scourge of the dairy, twin to abortion. It is an affection which comes without warning, attacks the deepest and richest milkers, is sudden in attack, rapid in progress, and generally fatal. The symptoms are a chill, twitching of the head muscles, failure to eat, chew the cud, or pass manure, distended udder without milk, insensibility of the hind quarters when pinched or pricked; later the cow becomes unsteady on her

hind legs, and presently drops. Good cows should be carefully watched for forty-eight hours after calving, and if such warnings appear a veterinarian cannot be called too soon. Preventive measures form the best assurance of the owner against losses from this cause. The cow should have abundant exercise up to the week before calving, and then quiet and good care, with daily grooming and active rubbing. Keep the bowels active with proper food, or purgatives if necessary. Insure comfort, guard against cold, and endeavour to maintain active circulation on the surface of the body. A strong dose of physic and brisk grooming may be used immediately after calving in the case of cows believed to be predisposed to milk fever.

CARE OF CALVES AND YOUNG STOCK.

Among dairy cattle the best practice is to remove the calf from the cow within twenty-four hours after its birth and at once teach it to drink. This separation may be delayed until the dam's milk assumes the normal condition, but as a rule the earlier the calf is taken in hand and its feeding regulated, the better for the calf. The younger it is, the easier it learns to drink. It is also better for the dairy cow to be regularly milked by hand than to suckle a calf. The milk of good cows is often too rich for their calves, and the latter are apt to take too much if left to help themselves. The calf should have the milk of its dam or some other fresh cow, and receive it while warm, and at least three times a day (preferably four) for a week or month. During this time, if the milk is rich, it should be diluted with warm water one-fifth to one-third its own bulk, according to the richness, or the milk may be kept a few hours, the best of the cream removed, and then warmed and fed. To make a good calf, three feedings a day should be kept up for a month or six weeks, and the milk should be fed warm for a longer period, especially if the weather is cold. But after ten days or so milk set twelve hours and lightly skimmed will do, and after

ten days more the skimming may be gradually made closer, until at the end of a month or soon after a skim-milk diet is reached. No rule can be given for quantity in feeding calves; they differ so much in size and food requirements. Judgment must be used, the feeding effects observed, and the calf given enough to thrive and be active, but not too much. More calves suffer from overfeeding than from scant diet. Keep the calf a little hungry and eager for more rather than fill it to dullness. The endeavour should be to prevent the beginning of indigestion, which leads to scouring and perhaps fatal diarrhoea. Nothing causes indigestion sooner than overfeeding or irregularity in the quantity, time, and temperature of the milk, especially while the calf is young; and absolute cleanliness about the feeding vessels is essential, with frequent scalding. If it can with certainty be kept equally clean, some feeding device which compels the calf to suck its milk instead of swallowing rapidly is preferable to the open pail; but, all considered, the latter is usually the best utensil. If gritting the teeth or other symptoms of indigestion appear, a little limewater in the milk or a little baking soda will usually prove a correction. Keep the calf dry and clean, fairly warm, but in pure air, and allow it to exercise. If its box is small, turn it daily into a covered yard or small paddock. Young calves like company, but if kept together are likely to learn bad sucking habits. Every calf had better have its own box until a month or two old, and then be tied up out of reach of neighbours; but several may exercise together if not turned out until an hour after taking milk.

The calf here referred to is not supposed to be for veal, but to be raised for a dairy cow. The foregoing treatment should be accompanied by early lessons inducing it to eat sweet hay and a little grain. The sooner it learns to eat hay or other rough forage and the more it eats the better; but keep up milk feeding as long as possible, if only once a day. Grain should be used sparingly, oats and bran preferred, perhaps a little linseed, and always to judiciously supplement the other food. Do not turn it on to grass

too soon. If a spring calf, carry it over to the second summer without pasturage. A fall calf will be in good shape to get its living from pasture its first summer.

Fall calves are generally better cared for, thrive better, and make better cows than those dropped in the spring; another reason for having cows calve in the autumn. The writer feels certain of getting better results, in the end, from raising four calves dropped at the season advised than from five born in the spring, and is inclined to make the comparison stronger.

From the time milk ceases to be the main food of the calf until the heifer drops her first calf (at which time she becomes a cow, if ever, regardless of age) the feeding of the animal should be with a view to nourishment and growth, without accumulation of flesh. When pasture is good, after the calf is six months old, there can be no better food; if grass is short or dry and growth slackens, supplement with clover hay, wheat bran, or oats. At other times let the food be mainly the coarser and more bulky kinds of forage; the digestive apparatus needs to be developed and become accustomed to working up large quantities of food. A big belly may result, but no matter. If accompanied with a well-sprung rib, a strong back and loin, depth of flank, and other marks of constitutional vigour, a big belly is to be desired, indicating capacity as a feeder and user of feeds. Give long forage, fodder, or "roughness" the preference with young stock, and use grain sparingly as needed to balance the ration and promote growth and thrift. A fall calf, well bred and healthfully grown, should "come in" when just about two years old, and ought to make a good cow.

ATTENDANCE AND MILKING.

A herd of good dairy cows deserves to have good care, and this can only be insured by having the right kind of attendants. If the owner is unable to either attend the cows himself or give the matter personal supervision twice a day or more, it is to his interest and profit to be certain that his employees are trustworthy and fit to be cow-keepers. Everyone should be quiet, even-tempered, gentle, and regular and cleanly in his habits. A

cow abominates an unclean man. Tobacco in all its forms is obnoxious to every department of dairying. All the work about the herd should be done with the utmost system and regularity—stable cleaning, grooming, exercise, watering, feeding, milking; a fixed time for everything and everything at its time—"on the dot." Nothing has been produced which begins to compare with the human hand as a milking machine. Cleanliness and regularity are the first requisites in good milking. Next, quiet and gentleness should be accompanied by quickness. Two milkers, one rapid and the other slow (the cow being accustomed to both), will get about the same quantity of milk in any given number of days, but the former will get the more fat. The quicker the milking, the richer the milk, if the work is done well and completely; the difference may not be great, but it is measurable in butter or money. Again, two men milking like quantities in like time, from the same cows or animals giving milk usually just alike, will get different results as to richness, and if they change places the richer milk is secured by the same man. The milk fat or butter fat comes from the cow, but it is the expert milker that gets the most of it. There seems to be an undefined and yet conclusively proved relation between some milkers and the cows they handle which produces this result. It is certain that change of milkers, manner or time of milking, irregularity, or any disturbance at milking time may be expected to cause loss of butter fat in the milk. In short, it pays, and pays well, to have milking done in the very best way, by the very best milkers that can be found. A superior milker should be appreciated and retained as persistently as a superior cow; the former is the more difficult to replace.

A very good practice, although uncommon, is to take every cow to a particular place to be milked, apart from where she usually stands; this to be a clean and airy place, like an open shed. The milking shed or room being kept scrupulously clean, with free movement of pure air, there is an almost certain exemption from what are usually called

"animal odours" in milk, but which really are stable odours or odours from the milker. It may be stated as a fact, and should always be remembered, that milk as it comes from the healthy cow is perfectly pure. It has by nature no unpleasant taste or smell (except an occasional result of peculiar food), and all those odours and flavours which are often so objectionable get into the milk after it is drawn from the udder of the cow. They come from the uncleaned body of the cow herself, or from her surroundings, the air of the stable, the milk vessel, or the clothing or person of the milker. These troubles are all avoidable; they are not to be charged to the cow, but to the man, her keeper.

With the exception of some extraordinarily large milkers, or for short periods when the yield is largest, there is no gain in milking cows more than twice a day. Within limits, it is true that, if properly done, the oftener a cow is milked the richer will be the milk; but the difference is very slight, and seldom, if ever, enough to pay for the extra labour. In one of the most noted and fully authenticated cases of immense milk production by one cow (a ton or more of milk a month for a year), the cow was milked every six hours for 365 days, every time by the same man, and always within two minutes of the right hour. This remarkable record was without doubt largely due to the milker, who was the feeder of the cow as well; indeed, the year's performance by the man was as noteworthy as that of the cow.

THE PASTURE SEASON AND SOILING.

As soon as the spring grass gets high enough for the cows to get a bite, let them have it. At first the time daily on pasture should be very short, for the good of both pasture and cow. The latter should be gradually changed from stable feeding to pasturage, especially if the feeding has been of dry material or mostly so. And the stable feeding should continue unchanged, undiminished, until the cow herself indicates that she is getting enough grass to replace a part of the stable ration. Then, as the pasturage improves, indoor

feeding may be lessened and finally discontinued. If a pasture furnishes an abundance and variety of grasses, there can be no better food found for the milch cow. The nutritive ratio for mixed pasturage is about 1 to 5, which cannot be improved for succulent food. But the best of pasture grasses contain from 65 to 75 per cent. of water, sometimes more, and the cow must procure a large quantity of this material, 100 pounds or so in the course of a day, to secure the food material required. Shade and water should be carefully looked after in connection with pasturage, as well as the grass. In very large pastures there should be watering places in different parts of the inclosure, as well as shade, that the cows may not be compelled to travel far to find either.

Until flies become bad, cows had better stay in pasture by day and in stable by night, or be left out all the time. But in the worst fly time, and perhaps when the sun's heat is greatest, it is good practice to stable the herd during the day in an airy but shaded cow house, and turn it out on pasture at night. If the pasture has not abundant shade and water this course should certainly be followed. Heat and flies reduce both quality and quantity of milk product. The trouble from flies can be largely remedied by spraying the cows with a very weak mixture of water and some one of the approved sheep-dip preparations. Such a spraying will last a week or ten days, unless there are hard rains meanwhile. The entire interior of the cow house should be sprayed with a solution of this kind, and strong enough for an insecticide weekly throughout the summer.

There is ample evidence that, although milk yield may be increased by feeding grain to cows at pasture, the gain no more than pays for the extra food, and seldom does that. There may be in some cases a small margin for profit in improving the pastures by less grazing and richer manure. But if pasturage is short, even temporarily deficient, the cows should be fed enough of grain, hay, silage, or green crops to supply the deficiency.

The dairyman who has most of his cows dry during drought, fly time, and "dog days" appreciates the advantages of "bringing in" his cows in the fall.

Soiling.—The advantages of soiling over pasturage are so great, especially where dairying or high-priced land, that every dairyman should carefully study the question of adopting this system. Much depends upon the supply, character, and cost of labour at one's command. It may be profitable to practice partial soiling where it will not be to do more. Careful trials have shown that by feeding cows wholly on green forage crops in the stable from two to five times as much milk can be produced from an acre as from pasturing the same land. Of course, farms often contain many acres of pasture land that cannot be tilled, but for tillable land the profit in soiling is great. Many more cows can be kept on a given area, and the productive capacity of the land can be rapidly increased. The saving of manure and its application to best advantage is one of the great gains in soiling.

For this system of feeding stock a variety of green crop is necessary, grown so as to come to best feeding condition in well-arranged succession throughout the growing season. There must be no breaks; the supply must be certain and sufficient. It is well to aim to grow about twice as much of every crop as one expects to use; any surplus can be saved by drying or putting in a silo. Crops well adapted to soiling in most parts of the country are these: Red clover and timothy, sown separately in July and August; crimson clover and barley, sown in August and September; and wheat and rye, sown in September and October—all these for use in (an open) winter and early spring. Oats, spring barley, and pease sown early in the spring; vetches, also corn and soja beans, planted or sown in May; cowpeas, corn, millets, and Hungarian grass, sown in June—these for cutting in the summer and fall. The first and second crops from the regular mowing lands of grass and clover will fill in the gaps.

A good deal of skilful management is needed to bring on the crops at the right

time in proper succession and in sufficient quantity. At least 110 pounds of green forage should be provided daily, on the average, for every 1,000 pounds' weight of cow; the quantity will vary much with the character of crop. By the soiling system, well managed, 1 acre may feed two cows for five or six months, and 3 acres for five cows is a conservative estimate.

One of the points of gain by soiling is saving the food expended by the animal in its exertion to procure its food at pasture. But moderate exercise should accompany soiling, and a small pasture lot or large paddock should be provided convenient to the cow house for use of the herd, especially at night.

THE STABLING SEASON.

Up to a certain point fall pasturage is as good as in any other part of the year. But after one or two hard frosts it is well to offer the cows some nice hay when they come in at night, and if they eat it with relish, one may be pretty certain the season has arrived to gradually change the herd from pasture to stable for the winter. The cows should not be left out at night after it becomes chilly, or be exposed to cold autumn storms. They may be allowed in the field a few hours on all pleasant days until snow flies, but without expecting them to get much besides water and exercise. Before keeping them steadily at the stable and yards, the feeding should be, by gradual steps, completely changed to the full stable diet.

Meanwhile, or on leisure days earlier in the year, the cow house should be prepared for its occupancy by the herd throughout the stabling season. Boxes, stalls, and feeding troughs or floor should be thoroughly cleaned and disinfected, so that no animal can discover or be subjected to any unpleasant traces of another and previous occupant of the place. Then assign every cow her particular place for the winter, and gently insist upon every one being always in the right place. The bedding, absorbents, and disinfectants should be provided in abundance, and in ample time for all to be quite dry. Use no damp material under a cow, no rotten straw, and no moist earth or sawdust. In order of efficiency, the best absorbents are peat,

spent tanbark, sawdust, wheat straw, forest leaves, and dry earth. If earth alone is used, from 30 to 40 pounds per cow will be needed daily—a big shovel-ful. If straw alone, provide 9 or 10 pounds a day, and less if cut short. A good combination is 5 or 6 pounds of straw and 10 or 12 of earth or sawdust. An excess of bedding or litter is undesirable. If the floor on which the cow lies is dry and not cold, very little litter is needed for true bedding. Its chief use is as an absorbent, and if more than necessary for this object is used, the manure becomes too dry and bulky, and is lessened in value per load. Land plaster is a very satisfactory disinfectant or deodorizer about a cow house. If one takes good care of the manure and intends to add chemical fertilizer, the latter may be used in the stable, in some forms, instead of plaster. A refuse of the "double phosphate" works is an article called phospho-plaster. This can often be got at about the same price as common plaster, and as it contains about one per cent. of phosphoric acid, it is a good addition to the stable manure, while also an efficient disinfectant. Kainit, about the lowest grade of German potash salt, is a good substitute for plaster in the stable. It costs half as much again, sometimes twice as much, but less of it may be used, and the potash it contains (11 to 13 per cent.) is a very desirable addition to the manure in several ways. From one to two pounds of kainit or plaster per day to each cow can be profitably used, scattered in the litter and along the gutters of the cow-house throughout the stabling season.

It is a mistake to be satisfied with watering the herd but once a day. If they can be induced to drink twice or three times a day, it should be done. Cows need much water. It has been found that the average milch cow requires about 81 pounds of water a day while in milk (nearly 10 gallons), and about 53 pounds while dry. Of this, the cow in milk takes rather more than two-thirds (say, 7 gallons) as drink, and the rest in her food, while the dry cow takes rather less than two-thirds as drink, and a little more than one-third in the food.

FEEDING THE HERD.

The first advice is not to feed the herd as a herd. Cows differ in their tastes and

in their requirements in the way of food just as human beings do, although perhaps not to the same extent. To feed all the cows in a herd alike, day after day, month after month, as is so often done, is an absurd and wasteful practice. Some are sure not to get enough for greatest profit, and others are likely to get more than they will use to advantage. This as to quantity only; but differences in kind of feed may be equally desirable. In a thorough study and comprehension

of the question of feeding lies the greatest opportunity for the exercise of real economy in the management of the dairy herd.

Scientific feeding means simply rational feeding, a common-sense application of a good understanding of the objects of feeding, the character of food materials, their proper relations, combinations and effects, and the needs and characteristics of the animals in hand.

Ancient Silos.

THE conservation of grain in caves and built underground silos has been practised from time immemorial by the various races of whom we have any ancient records. In a late number of the *Journal d'Agriculture Pratique* are given sketches of different kinds of silos, of which we take the following:—

Fig. 1 is a vertical section of a Roman silo built of solid masonry and cemented, in which grain was often kept for very

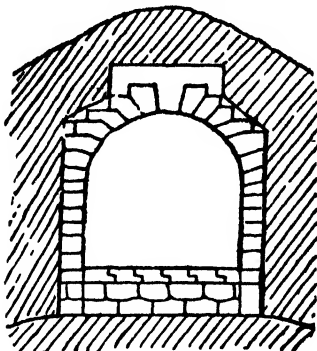


FIG 1.

long periods. In one of these silos it is said that beans were kept for 150 years. Silos were also cut out of the rocks, hill-sides being chosen for the purpose, where there was no danger of the contents becoming damp. The Moors built silos on the same plan as the Romans, the remains of many having been found in Spain.

Fig. 2 is a vertical section of a Hungarian silo built of brick. Where the soil was suitable silos were excavated in the soil, which was hardened by a wood fire, and the interior was covered with matting. A silo was discovered about the

beginning of the last century near Sedan. It was cut out of the rock, and contained a quantity of wheat that had been stored therein for 110 years. The upper layers

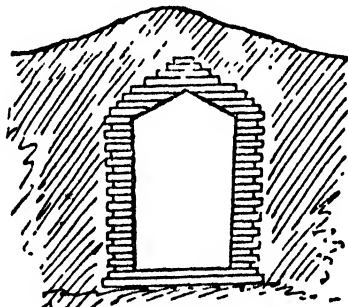


FIG. 2.

of grain were decayed, but the under portion, when ground, made excellent bread. The first silo made in Australia was near Sydney soon after the settlement was established. It was built for storing grain. The plan of conserving green fodder in silos was first employed by the German agriculturists.

In 1856 the goodwill, printing plant, etc., of the *American Agriculturist* was sold for £45. The capital of the company now publishing that popular publication is £100,000.

Professor Cossar Ewart, remarking on the prevalence of dun ponies in the west of Ireland, suggests that the aboriginal horse of the region may have been of this colour, and, like some of the Iceland ponies of the present day, sufficiently prepotent to pass on their coloration to a large proportion of their descendants. The yellow dun ponies of Connemara are highly prized in some districts, not only because they are hardy and easily kept, but also because in staying powers and vitality they are more like mules than horses.

Citrus-Growing in America.

REPORT BY A QUEENSLANDER.

THE following paper, written by Mr. Austin Bigg, was read at the annual meeting of the Queensland Citrus growers on the 11th December last.

The pretty town of Los Angeles is the great centre of the vast citrus groves of California, and contains, at the Chamber of Commerce, a magnificent collection of every kind of fruit grown in the district. Nothing new or startling, but in the cases are splendid specimens of fruits grown in Queensland, and closely resembling the exhibits at our Toowoomba shows. In a trip from this town to Pomona and Riverside we passed through one continuous orchard. As far as the eye can see, and stretching out on each side of the line, are nothing but oranges, lemons, and deciduous trees of all kinds, with here and there a plot of walnuts and pecans. No fences or dividing lines are visible. The country is almost flat, with a gentle slope north and east. The soil is a very light, sandy loam, of good depth, and easily worked. Most of the orange trees were in full bloom, and outwardly they presented a very pretty, clean, and bright appearance; but, on close examination, I found every tree upon its inside a mass of "Mussel," or "Black Scale." Not a single tree did I find in Pomona that was free from this pest; but all the scale was dead, the tree having been fumigated by the Pomona Fruit-growers' Association. There were no traces of "Red Scale," "White Scale," which last named pest once threatened total extermination of the citrus tribe, is now rarely seen; thanks to the Australian ladybird, which was imported in large numbers and turned loose in the orchards. They are now carefully bred by the association, whose entymologist turns them out on any trees reported as infested! . . . This example should be to our profit, as many orchards in Queensland are infested with "White Scale." In pruning, beyond the cutting out of dead wood, and lopping the bottom branches, nothing is permitted. The trees are bushes, pure

and simple, and would perish in Queensland if left in the same state there.

All the success here is due to irrigation. The water is supplied by the Pomona Land and Water Company, supplemented by private windmills. The plough opens a furrow near the outer branches of the trees, and water is turned on from the "flumes" or wooden troughs which run in necessary directions. The water is applied generally twice a month, during the flowering season, afterwards once a month until the oranges turn colour. Without this irrigation no oranges, or, indeed, any other crop, could possibly grow or flourish here. The average rainfall is only 10in., but for the last four years it has fallen to 8in. The area of each holding varies from 10 to 100 acres. The first orange tree was planted here thirty years ago, and fifteen years represents the average age of the trees in the orchards, which are small when compared with Queensland trees of similar ages. In many cases frost has checked the growth of those here, by killing the topmost unripened wood. In some instances the whole tree had been cut off, and given a fresh start. Our own Australian gum had been extensively used as a breakwind-guard, but the planting of these trees is now found to be suicidal folly, because three rows of citrus trees on each side of the "guard" are practically valueless. They are now beginning to destroy our gums, which, as we know, is not an easy matter.

The kinds grown are almost exclusively the "Washington Navel," with a few "St. Michael," "Mediterranean Sweets," and "Late Valencias." The fruit on these latter are in a terrible mess, being covered with "Black Smut," and are cleaned at the packing stations. Mandarins are conspicuous by their absence; only a tree here and there, of which the fruit is miserably small, and bears no resemblance to our Queensland article. The "Washington Navel" is held in high esteem, and is universally grown, all the stock having been obtained from

one tree. In 1870, W. Saunders, of Washington, D.C., procured twelve budded Navel trees from Bahia, Brazil. They were planted in the orange grove at house at Washington, and some are still bearing fruit. One of these trees showed marked superiority and productiveness, and scions, or buds, were taken from it for propagation. In 1873, Luther E. Tibbets, of Riverside, Cal., obtained a tree from W. Saunders, and planted it. The peculiar excellence of the fruit borne by this Riverside "parent of orchards" speedily attracted attention, and from this all the several million trees in California may trace their descent. A boom in orange-planting soon set in, and the whole of Southern California (wherever facilities for irrigation were present) became one vast orchard. Statistics give 50,000 acres in full bearing. The total output this season has been 20,000 rail-car loads, each car containing 365 cases. As in Queensland, so here, every grower acted on "his lonesome." Competition was keen, the local market was flooded, prices were ruinously low, and the industry was in a most depressed condition. It did not pay to grow oranges. A few thinking men, who had large interests in this industry, tried to remedy matters. They called meetings of the growers, and started the Californian Fruit-growers' Association. In fact, they did exactly what we are doing in Queensland with the dairy industry. Their efforts were weak at first, and clumsy in design. Many mistakes were made, but gradually and surely there evolved from chaos a most complete system of syndicateism, which now practically embraces all the growers. Very few indeed are outside; in spite of themselves they must come in and join the association. This new venture in combination soon proved to be a great relief, and largely augmented returns came in. The orchards soon paid their way—e.g., after paying all expenses, on one acre per year, as follows:—Irrigation, 25 dollars; taxes, 25 dollars; labour, 100 dollars; fertilisers (stable and sheep manure, guano, nitrates, etc.), there was a net gain of 225 dollars per acre in an orchard 10 years old. Reckoning 300 cases per acre as an average output.

Growers deliver to the Exchange. The oranges are picked, put into sacks, or cases, and in some instances are in a terribly dirty condition, being covered with "black smut." They are first weighed (weight card enclosed), and hand graded into "fancy," "choice," and "standard," then reweighed separately, and the result card, showing the classes, is then handed to the grower. These three classes contain the fruits of every grower mixed together. A's, "fancies," go with B's, C's, D's, etc., and so on, with "choice" and "standard." It by no means follows that "fancy" class contains all the large oranges. The market demand regulates this. The various grades are now passed through the brushing, polishing, and grading machines. The dirty fruit is treated in a special machine, which consists of (1) a large trough of water, through which the fruit passes on to a perpendicular wheel of stiff brushes. (2) An elevator carries it to the "drying benches." These are large tables of strips of wood 2in. wide with 1in. open space between strips to admit the air and dry the fruit quickly. It is then sent on to the "dry brusher," "polisher," and "grader." Each division represents 60, 80, 120, 200, etc., to a case. Girls stand at each division-receptacle, rapidly place each orange in its tissue-paper wrapper, upon which is printed the name of the association (specimen wrappers enclosed), and place them row upon row in the case. A man takes the case, which is then labelled with a tasteful litho. label, stamped, and numbered with "No in case," etc., nails on the top, and places it in a rail-car adjoining the packing shed, duly consigned to its proper destination. These scrubbing, polishing, and grading machines are chiefly run by electric motor power, and are truly elaborate, and do splendid work. The orange comes from them beautifully bright and clean.

The San Francisco market does not deal with the whole of the fruit produced here, but is generally regarded as the "dumping ground" or output for all inferior fruit. The choice fruit is sent to the Eastern towns. At the time of writing, "market reports" of New York City show oranges fetching 5 dollars per case.

The association employs representatives in all the large cities. They sell to the best advantage, and hold over, as occasion requires, or if prices are not satisfactory. The average price for the whole season of 1900-1, which commenced 1st November and ended 1st June, was 1 dollar 50 cents per box net, *i.e.*, after paying all association expenses. In addition to this, a dividend is declared, in which all members participate *pro rata*. . . . Fruit-packing associations are in every district. There are now few, if any, "outsiders." These "outsiders" were the men who caused all the trouble. Having only a small area of a few trees, they sold at unremunerative prices, and prejudiced the sale of good fruit. All this is now changed. Smiling faces and happy, picturesque homes meet the gaze wherever I go.

It would be impossible for every orchardist in Queensland to obtain one of the elaborate machines already referred to, such as made by F. Stebler, and Wright Bros., Riverside, California. The expense would not warrant the outlay. Let us build a factory and packing-house in Brisbane, which would deal with every member's fruit. And, if necessary, one in Maryborough also. Enormous labour would at once be taken off our hands. Our prices received would be doubled. But let the scheme embrace all, as in California. The public would then deal directly with the association, and would be able to obtain a true class fruit, superior, clean, and attractive. We must sink all petty jealousies, become united, and work as one for the mutual good. As they have done here in California, so also should we be able to do in Queensland.

Dairy Farming in New Zealand.

A CORRESPONDENT, writing in the *Live Stock Journal*, gives some particulars relating to dairying in New Zealand, which soon promises to become one vast dairy farm. The correspondent says:—

"It would be as well, perhaps, to preface my remarks by calling attention to the much simpler methods of farming as carried on in this part of the world, the principal reason being the climate and the fertility of the soil. For instance, no such thing as housing cattle is ever done, and the growing of winter feed is only carried out by a minority, who may grow a small patch of mangels and a stack of hay. Naturally an industry such as this, where the only qualities required for a man to start in life are sobriety, hard work, and a large family, must in itself produce many types, and one finds men from every class of life engaged in the business. It naturally follows that dairying as it is carried on here to-day has a vast field for improvement, and when later on, say in the next generation, when New Zealand has men on the land that have been bred and brought up on it, no doubt the bene-

fits from proper training will be seen in the cows that are milked and the returns from the factory; but owing to the policy of the Government in inducing men from all trades to go on the land, it follows naturally that a man who a week before was probably plying his needle at his tailor's bench must make rather an exhibition of himself for the first few months of his farming operation, and this, perhaps, is the surest guide to the soundness of the industry when men such as these cannot only make a living, but put money by for a rainy day.

There are two methods under which dairying is carried on under the share system, the first being halves, in which the owner of the land supplies all the cows, land, sheds, house, utensils, etc. Usually the man has to find his own horse and trap, and the proceeds of butter-fat, calves, and pigs are divided equally between the two. As to the minor details, they vary just as much as human nature does; sometimes the owner of the property insists on a man building a house, so that he will have a pecuniary interest in the venture, though I only know of one in-

stance of this being done; also the amount of winter feed of hay to be grown, or the time the pigs and calves are to be sold may be stipulated. Such details as these so entirely depend upon the man one is dealing with that up to the present there has not been a uniform agreement, and the plan favours the best bargainer. This half system is the one mostly in vogue, its chief advantage from a working man's point of view being the very small amount of capital required to get a start; and it is evident that the advantage is all on the side of the owner of the land, as the men never stop after they have made sufficient to commence on their own.

In the other system the owner of the land supplies everything to begin with, and takes two-thirds of the cheque from the butter-fat, and the tenant gets the remaining one-third, all the skim milk, all the calves (except one heifer in five or one in ten, according to the size of the herd), and all the pigs.

This agreement was practically forced on owners of land who desired to go into this class of business, owing to the constantly-recurring bother as to what bull should be used, and as to whether the skim milk should go to fatten pigs or rearing calves, since at times calves are only worth 10s. to 15s. at weaning, though

this present season they have been fetching double this money, and pigs, which are much more regular in their values, are worth 3½d. to 4d. per lb., the highest figure being given for those who kill 80 lb. to 100 lb., down to 3½d. for those whose weight exceeds 120 lb. when fit for the bacon factory. In both instances the milk goes to the creamery, where it is separated, and cream forwarded on to factory, which might be combined with the creamery, or eighty or 100 miles away, when the cream is forwarded by rail; in any case, monthly payments are made, and these, in the first instance, are always sent to the owner of the land.

The return per cow is from 8s. to 10s., which will, in the future, with better methods, go on increasing. The employee or tenant has to find all labour. It usually takes two acres to run a cow and do her justice, but in this particular district she will do well on an acre and a half.

It is only during the last two seasons that dairymen have reared their calves with the help of other ingredients than skim milk. Some use now molasses, cod-liver oil, and various calf meals made up by local storekeepers; they found this necessary owing to the high death rate.

Correspondence.

To the Editor Agricultural Journal.

11, Gertrude Street,
Pietermaritzburg,
February 24th, 1903.

DEAR SIR,—I notice in your last issue that your correspondent "Ergates" has had a chat with Mr. F. Symons, Glenbella, Willow Grange, and in the course of the interview, when questioned about pruning, Mr. Symons said that the matter was a debatable one, and that he left his trees to their natural growth. I am very much surprised at this, more especially as he originally obtained his trees from America, where, by the latest books that

I have seen, the fruit growers there do not say that pruning is a debatable matter, but that it is a matter of necessity, and that by doing so they got a better and finer quality of fruit. This class of fruit, they hold, pays them much better than a larger quantity of smaller fruit which is obtained by leaving trees to their natural growth.—Yours truly,

J. HOPENE.

[On the principles of pruning fruit trees, our correspondent will find an article by Mr. T. R. Sim, Conservator of Forests, in this issue.—*Ed., Agricultural Journal.*]

NITRATE OF SODA.

319, Smith Street,
Durban, 28th February, 1903.

SIR,—Having read with much interest the description in your last issue of the experiments with various manures at the Government Experimental Farm, I was glad to have the opportunity to-day, through the courtesy of the Director of Agriculture and the Farm Manager, of being shown the experimental plots.

The differences between the differently manured plots of mealies are even more striking than they appeared from the published photograph, and show, even at the present stage, that on the Government Farm Superphosphate, or Superphosphate mixed with Sulphate of Ammonia, is the best manure for mealies. Till the crop is actually reaped, it will be impossible to tell whether the increase given by the addition of Sulphate of Ammonia to the Superphosphate is sufficient to warrant its use, as this manure is not likely in the near future to be procurable here except at a figure considerably above Home prices.

It is most probable, however, that on this crop an equivalent quantity of Nitrate of Soda would give an equally satisfactory result, and this will doubtless be tried in conjunction with Superphosphate in future experiments.

Nitrate of Soda would be in this country a relatively cheaper source of Nitrogen than Sulphate of Ammonia, for, if the demand were sufficient to warrant a large importation, my company (The South African Fertilizers Co.) could place Nitrate of Soda on the Natal market at very little above European prices.

I would venture to recommend every farmer who can possibly do so to see these plots for himself. I expect that many progressive farmers will wish to make such accurate practical experiments for themselves to see whether the same results are got on their farms as are given under the conditions of soil and climate which pertain at Hilton Road.—Yours faithfully,

A. M. NEILSON.

NOTE BY THE DIRECTOR OF AGRICULTURE.—There is no doubt that an

equivalent quantity of Nitrate of Soda would have practically the same effect as Sulphate of Ammonia would. As to which should be used is more a question of price than anything else: 100lbs. of Sulphate of Ammonia offered now in Durban at 17s. would have the same effect as 130lbs. of the Nitrate of Soda now offered, which would cost in Durban 18s. 9d., and on which there would be 30 per cent. more railway freight and transport charges. The only objection to the use here of either Nitrate of Soda or Sulphate of Ammonia is their heavy cost. Nitrate of Soda, containing 15½ per cent. Nitrogen, is sold at £16 5s. per long ton, and Sulphate of Ammonia, containing 20 per cent. Nitrogen, at £19. If the South African Fertilizers Co., or anybody else, can, by means of direct importations from South America, offer Nitrate of Soda in Durban at a little above the European price, namely, £8 a ton, they will be in a position to do a considerable service to the agriculture of this country.—A. N. P.

Some American Rat Poisons.

CARBONATE OF BARYTA.

Mealie meal, oatmeal, or wheat
flour 6 ounces.
Sugar 6 ounces.
Carbonate of baryta 4 ounces.
Anise-seed oil sufficient to give mixture a strong odour.

TARTAR EMETIC.

Tartar emetic 1 part.
Mealie meal, oatmeal, or flour . . 1 part.
Beef or mutton suet sufficient to make into a paste.

FRENCH PASTE.

Mealie, or oatmeal, or flour . . 3 pounds.
Indigo (powdered) ½ ounce.
Arsenic (powdered white) . . 4 ounces.
Anise-seed oil ½ drachm.

Mix together and add 2½ pounds of melted beef, suet, or tallow, and work whole into a paste.

Noodsberg Road Agricultural Association.

THE following is taken from the Annual Report of the President, Mr. H. von Buelow, of the above Association:—

Mealies are now in greater demand at improved prices, which is very welcome to farmers after the low prices ruling while the war lasted. To a certain extent low prices were due to the Imperial Authorities importing large quantities. It will pay farmers well to increase their acreage of mealies, but only if able to cultivate thoroughly, this being the main thing with mealies growing. Mealies will not yield as they should unless properly manured and kept clean of weeds.

Last year, generally speaking, was very satisfactory, both crops and prices being good. The want of labour has, in the last few years, been felt more than ever; even the supply of Indians failing, and making it impossible for the Indian Immigration Department to fill indentas as quickly as desirable. A deputation has been sent by the Department to India to negotiate there for a larger area in which to recruit, this having been rather small formerly. It is hoped that the effort will be successful, as this shortness of labour is a very serious matter.

So far, during the season, farming operations have been hampered by an exceptionally severe drought, making it impossible for farmers to plough their full acreage, and also hindering the growth of the mealies, as well as causing the wattle trees not to strip. This makes it difficult to employ labour—for those who have it—profitably; even firewood, the sawing and transport of which has always been a job for odd times, has lately dropped to a price which will only pay those who live within a very few miles from a railway station. It is at a time like this that the want of a branch line to the centre of our district is more keenly felt. Government is,

I believe, considering the building of such a line, a Bill for which would find supporters among members of both sides of the House of Assembly. It is advisable to do something in the way of petitioning our members to bring forward a Bill to that effect.

Whilst on the subject of railways, I may mention that complaints regarding delay in the forwarding of goods by the N.G.R. are still so frequently heard that one cannot help thinking the Department is to blame. I do not know, however, whether people put facts of cases as clearly and as frequently as they should do, to get this remedied, before the management. Without doing so, there is little hope of improvement.

There have been renewed outbreaks of rinderpest, but not in so virulent a form as at the time of the first outbreak in the Colony.

A great scarcity of breeding cattle still prevails. Arrangements have now been made with the French Authorities to allow the exportation of breeding cattle from Madagascar.

The Agricultural Department has in many cases done good work in the interest of farming in Natal, and cannot be too highly praised for publishing reports such as Mr. Claude Fuller's and Mr. Alex. Pardy's.

From the financial report submitted at the last meeting you will have seen that our Association is still in the good position it has been in all along, and due largely to the untiring effort, on behalf of the Association, of the Secretary, Mr. Fritz Reiche. Before Mr. Reiche's departure for a visit to Germany, a purse was handed to him to show in a small way our appreciation of his services.

In conclusion, I thank the Committee, in the name of the Association, for their services and you all for electing me as President.

Side Lights on Argentina.

FROM a Victorian who has recently been to the Argentine we have received a private letter, says *The Pastoralists' Review*, from which we make the following extracts:—

THE WOOL TRADE.

The British buyers are not in this market; all orders for England and America

are executed through French and a few German houses, and a real good thing they have on. The wool comes down tied up in sheets of stout Hessian about as big as a bed sheet, and the four corners tied together (like the old up-country people tie up their bundle in a red handkerchief). The wool is discharged at the immense central market, where it is

thrown out in heaps; the buyers make private offers for it, and the highest (?) offer gets it. When it is purchased the buyer has it all tied up again in Hessian sheets (his own), and carts it to his store, where it is classed or sorted, as a rule, and then baled up and shipped. A certain percentage is almost always "rejected," because, through specific gravity, the worst fleeces sink to the bottom of the pile, as a rule, but there is never any fuss, and all goes on happily for consignee and buyer. There are no big selling brokers here, but about 150 consignees, who don't know anything about the business, nor do they pretend to. The present manner of working pays all parties handsomely, and as all are satisfied why make any change? Most British estancieros, however, send their clip to England through British houses, get it packed at a price and pay plenty of commission, at which they growl in true British fashion, but there it ends.

A STUD SHEEP SALE.

Just after I got here some imported Lincoln rams were sold; I went and inspected them, and attended the sale, etc. Never was more amused in my life. The rams were in pens, eight or ten in each pen in a saleyard like Kirk's Bazaar, but most elaborately got up. They had just come up from the steamer, and a Spaniard or two tackled them and parted them carefully all down the centre of the back. Then they opened them up, and split all the stables into smaller locks; then they trimmed them all over with shears and made the outside of the fleece all nice and smooth and pretty, and then the vandal poured linseed oil in his hand and "hair-dressed" them, about a quart of oil on each sheep, and finally got a plasterer's plastering board, and patted them all nice and smooth all over, and the rams then had their toilet complete for the sale. Imagine this being done in public, all the buyers standing round and admiring the operation. To examine the rams you pluck three or four fibres out of one off the ribs or somewhere, and then do likewise out of another, and you hold the respective hairs up to the light and then on your coat sleeve, to see which is the

finest; those with you discuss and finally decide the point in question, then you decide which is the biggest, and the trick is done. In the afternoon; in the centre of the yard is an enclosure with nicely finished railing round it, a splendid piece of carpentry work; the floor has sawdust on it, and you look for the "gloves." It appears that there is a big boxing contest coming off and you have come to the wrong place. All round "the ring" are comfortable chairs and stools, each with "programme" (catalogue) on it, and shortly after the advertised time some gentlemen and "others" peaceably take their seats and smoke cigarettes. At one side is a handsome little pulpit and finally into this gets a fat, calm, sleepy individual—the auctioneer. Shades of Maiden and Jack Stanford! did I say auctioneer? Such auctioneering. He waited till he got a bid for the first ram put in the ring, and then sweetly warbled in Spanish the amount of that bid till he got another, and so on. The top ram brought £47, and was well sold at the price on our Australian basis. It took the better part of the afternoon to sell about thirty-five or forty, and all went on peacefully. They were fat as pigs, and were not of a type that would have sold with us.

EXCESS OF CROSSING.

Crossing is carried to great lengths here with all stock. You could hardly find a pure-bred horse of any breed, except importations; they are half hackney, half something else, half Morgan (American), half something else, half German draft, etc. Cattle are mostly graded up to Durhams in the better lots, but there are French bulls and all sorts used, and often in herds you will see three or four different breeds of bulls in the same mob of cows.

SHOWS.

In a recent number of *The Pastoralists' Review* it speaks of the large numbers of stock at the fair at Palermo, and the number of animals "shown," and compares this with the National in Sydney. They are not to be compared; they are different things. Palermo is mainly a fair or sale. I saw the autumn show at Palermo; there are not sires or breeding stock for show, but stuff for sale—carriage horses, hacks,

etc., bulls (many only ordinary herds; you can get forty pedigrees for each bull if you want it, and another forty more if you pay a little more). Many are what they call "pure by crossing," which actually means have got three crosses (or two only, perhaps), of the named imported blood. All are fat as seals, beautifully toiletted, teeth brushed, horns polished, and are chock full of arsenic. Arsenic is used right and left in carriage horses, and so on.

Now, as for coming here. It is God's own Paradise of a country for anyone who can come and buy a place who has money to do it, and a good knowledge of stock and how to work them. The climate is that of the Garden of Eden—hot in the north, true cold in the south, but moist and rainy; water everywhere a few feet under the ground; rich black soil, generally from 4 ft. to much deeper, say, 12 or 20 ft., resting on a limestone formation called toasca, and in this toasca you get water, any amount. In this Province (Buenos Ayres) it is rather too watery often; lagoons and swamps in lots of places, but they can mostly be drained when these lazy Latins get wakened up. I was at one place where they ran two and a quarter sheep and one bullock to the acre, and had a lot of horses besides. Natural grass, always green, growing as fast as ever it can grow, and when properly worked and the stock properly managed, it will be worth far, far more than now. There must be a great increase in value. For those who come to work, to labour, it is not the place to come. The men on the stations get equal to about 45s. per month, and it costs about 3s. to 4s. per week to "feed" them—meat, "camp biscuit," and pumpkin, with "mattie" (or Paraguayan tea). They are all Spandiards and Italians, etc., but they do as much as the bush Colonial, and are cheap labour and good at the price. A navy gets about 3s. 4d. per day on the railway, and so on.

Now, of the English Colony. It is very, very English, you know. Most are younger sons of the good families, college men, etc., who have been brought up with expensive tastes, who are unable to live in England, as their incomes won't allow them to live as they have been brought up, so they have come out here and gone into squatting, and can live in a very good style. You don't see them going about dressed anyway, as our poor squatter does. Here it is English topboots—polished to a turn, English riding breeches of the latest true cut, with the proper number of buttons at the knee, and the bit of tan leather on the bottom of the breeches, just showing above the boot, the proper collar and the proper thing in neckties. Ladies ditto. On all English estancias you dress for dinner—evening dress. As to management of the property, that is another question. The Almighty gave them such a grand country that any management, or, indeed no management, did all right, but things are changing, and I think they will have to wake up some day before long. It is a glow of luxury on one hand, and on the other a hades of dark and grinding poverty. Do not urge any of our fellows to come here unless they come to buy a property. It is no use coming to look for an opening in something.

SCAB.

The sheep are thick with scab from one end of the country to the other; its a terrible sight, and there seems no way of curing it. Our old Scab Act, you would say. Pooh! the Natives would never dip. A few dollars to the inspector who came to see him dip, and he would see or sign or swear to anything, and persecute those who did not come up to the scratch with good fat palm oil, and it would just put matters from the frying-pan into the fire. So those who try to do anything just keep dipping away about six times a year. I have not seen a flock yet that was not thick with scab.

Dressings for Lucerne.

THE common idea that lucerne, being a leguminous crop, is independent of artificial dressings for its supply of

nitrogen, is not confirmed by the results of some experiments conducted by Dr. Bernard Dyer, and described by him in

the Journal of the Royal Agricultural Society. On the contrary, a liberal quantity of nitrate of soda was of the utmost significance in increasing the weight of yield. This result may have far-reaching issues in connection with the growth of lucerne, for it seems that by the use of liberal dressings of nitrogenous manures land that is not naturally suited for the plant may be made to grow it on a profitable scale.

Dr. Dyer does not seek to refute the accepted truth that lucerne, like other leguminous plants, can fix and utilise the nitrogen of the atmosphere; indeed, he expressly mentions his firm conviction of the accuracy of that theory. But he contends that the plant is not capable of exercising its peculiar function independently of the condition of the soil in which it is sown. If the soil is in a high state of cultivation, both physically and manurally, supplementary artificial supplies of nitrogenous manures may be un-

necessary; but, on the other hand, if the soil is poor and has not been over well farmed, the plant is so considerably hampered in its enriching operations as to remove its independence in respect to its requirements of nitrogen. Dr. Dyer found that the addition of 2 cwt. per acre of nitrate of soda to 3 cwt. or 4 cwt. of superphosphate and 1 cwt. sulphate of potash gave very profitable returns, that quantity being better than 1 cwt., which in turn was preferable to 4 cwt.

Dr. Dyer suggests that the case of perennial crops like lucerne, in regard to the question of self-fertilisation, differs materially from that of rotation crops, such as clover and beans. These latter have the important advantage of a good start in a well-prepared soil usually containing the residue of previous manurial dressings, whereas the permanent lucerne is left absolutely to its own resources.—*(able.*

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Owl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

No. 40a.—Aged 26, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barberton District of Transvaal. Is anxious to get work, irrespective to nature of employment.

No. 42a.—Englishman, 24 years of age. Has had life experience of agricultural, stock, and dairy farming in Cheshire, where he had the management of a farm, and gained several prizes for cheese-making. Is anxious to get on to a dairy farm, if possible.

No. 43a.—Is at present a student at the School of Agriculture, Kutti, near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.

The following recipe to fatten a lean horse was used in the 16th and 17th centuries:—Take two sheep heads, boil them in 3 gallons of ale or fair running water until the flesh be consumed from the bones; that done, strain it through a fine cloth, and then put thereunto of sugar one pound, of cinnamon two ounces, of conserve of roses, of barberries, of cherries, of each two ounces; and mingle them together and give the horse every day in the morning a quart thereof, lukewarm, until all be spent; and after every time he drinketh, let him be walked up and down in the stable, or else abroad if the weather be warm, and not windy; and let him neither eat nor drink in two hours after, and let him drink no cold water, but lukewarm, the space of fifteen days, and let him be fed by little and little with such meat as the horse hath most appetite unto."

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab Lungsickness	N. Grant ... P. G. Boshoff ... J. Wood ...	Brakfontein. Smalideal. Pilgrims' Rest.
J. Button ..	Estcourt, South of Bushman's River	Lungsickness "	J. B. Brewitt ... R. R. Wright	Wagon Drift. The Alps.
J. J. Hodson ...	Lion's River ...	Scab " " "	J. King ... O. Strapp ... J. & E. Parker ... E. Parkinson ...	Lynedoch. Oatlands. Tetworth. Klipfontein.
K. Soutar ...	Portion of Lion's River	"	F. Stanley ...	Nonpariel.
R. Vause ...	Ixopo ...	" "	Shelana ... J. P. Vause ... Ikonyela ...	Mackenzie. Thorninghurst. Springvale.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
R. J. Raw ...	Impendhle ...	Scab "	Mahandan ... Nomandindi ...	Impendhle Location "
A. H. Ball ...	Weenen ...	"	J. Crathorne ...	Beaconsfield.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Vanderjank ...	Lovedale.
G. N. Perfect ...	Umvoti, East ...	"	Thos. Hill ...	Stolzenvols.
A. S. Parkinson ...	New Hanover ...	" "	Makenke & others { Bongola & others }	Swazimana's Location.
E. Varty ...	Umvoti, West	"	E. Simkins ...	Holmesdale
C. J. Van Rooyen	Krantzkop ...	"	H. T. Van Rooyen	Krantzkop.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 30 herds of cattle under license for Lungsickness, and 10 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	4 for Lungsickness, — for Scab
Klip River	"	...	10	" 2 "
Dundee	"	...	2	" 6 "
Umsinga	"	...	2	" — "
Upper Tugela (North of Tugela River) Division	...	...	—	" 2 "
Zululand—Ehohwe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	2	" — "
Nkandhla and Ngutu Districts...	...	...	3	" — "
North of White Umfolosi and Umfolosi Rivers	...	...	7	" — "
Total	...	...	30	10

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Town Lands, Ladysmith.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolozi District, Nqutu District, Nkandhla District, Ndawandwe District, Nongomo District.

Krantzkop Division :—Amobonvu Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 4th March, 1903.

Weekly Rinderpest Report.

UP TO 3RD MARCH, 1903.

Ladysmith Division.

Ladysmith Commonage, near Umbulwana.—No deaths ; no fresh cases.

Krantzkop Division.

Amobonvu Location.—No report received.

Zululand.

Eshowe District.—19 dead ; 20 sick.

Mahlabatini District.—5 dead ; 8 sick.

Umlalazi District.—9 dead ; 13 sick.

Lower Umfolozi District.—18 dead ; 25 sick.

Nkandhla District.—25 dead ; 30 sick.
Entonjaneni District.—53 dead ; 42 sick.

Nongoma District.—13 dead ; 20 sick.

Vryheid District.

Eight farms in quarantine.—20 dead ; 17 sick.

Paulpietersburg District.

Seven farms in quarantine.—4 dead ; 5 sick.

M. J. HIME,

for P.V. Surgeon.

3rd March, 1903.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write :—There has been no improvement in the market since our last report. In some parts of the Colony a little rain has fallen, and one is now daily accustomed to the following reports from every district, viz., that, owing to the unprecedented drought, there will be little or no hay or mealies. This, with the plague still in existence at the Port, and the difficulty of discharging vessels owing to the scarcity of labour, makes produce business anything but pleasant.

Mealies.—Notwithstanding the arrival of Americans at the Poinr, prices are firm. Of course, Natal mealies are very scarce, but, had it not been for the panic amongst the Natives in Durban, which has prevented the discharging of grain from vessels in the harbour, matters would have gone along smoothly. Natal mealies have averaged about 21s. 6d.; Americans somewhat in the vicinity of 20s. per muid.

Forage.—From 6s. 9d. to 9s. 3d. per 100 lbs.

Hay.—Hay is still high in price, and has fluctuated between 3s. 6d., 5s., and 6s. 8d. per 100 lbs.

Onions.—From 2s. 6d. to 10s. 9d. per 100 lbs.

Potatoes.—Some samples, only fit for seed, have been as low as 3s. and 3s. 3d.; samples fit for table have realised from 10s. 3d. to 14s. 9d. per 100 lbs.

Mabele.—One morning geba realised 7s. 6d. per 100 lbs.; but true mabele has realised 12s. 6d. to 14s. 6d. per 100 lbs.

Buckwheat.—From 14s to 14s 9d per 100 lbs.

Beans. From 14s. to 21s. per 100 lbs.

Lucerne.—Almost every morning good samples of lucerne are disposed of; the prices varying between 3s. 6d. and 5s. per 100 lbs.

Pumpkins. From 3s. to 10s. per doz.

Peas.—From 8s 6d. to 10s per 100 lbs.

Tobacco.—Several small lots offered; but as only 2½d. per lb. was realised, the price proclaims to smokers its quality.

Butter.—Some samples disposed of realised 6d., 9d., and 1s per lb., others 1s. 10d. to 2s 5d.

Eggs.—From 1s. 7d. to 4s per doz.

Poultry.—Common fowls 1s. 6d. to 3s. 9d.; however, some good bred fowls realised from 4s. 3d. to 10s. each; geese (dressed) from 3s. 6d. to 5s. each; ducks from 6s 6d. to 11s. 3d. per pair; (dressed) 2s. 9d. to 3s. each; turkeys (cocks) 7s to 16s. 6d. each; (hens) 8s. 9d. each; (dressed) from 6s. 1d. to 7s. 9d. each.

Sundries.—Mutton, 6d to 9½d. per lb.; pork, 6d. to 8d. per lb.; bacon, 5d. to 7d per lb.; ham, 7d. per lb.; fish, according to size; hares, 2s each.

Vegetables.—Beans, beetroot, cabbages, carrots, celery, chillies, cucumbers, lettuce, mealies (green), radishes, rhubarb, tomatoes, and turnips.

Fruit.—Apples, bananas, figs, grenadillas, grapes, mangoes, oranges, pears, plums, peaches, papaws, quinces, pineapples. A quantity of Cape fruit has been disposed of during the last fortnight. This season has been exceptionally good for fruit, as the exhibits displayed at the

last Show of the Pietermaritzburg Horticultural Society fully testified; in fact, never has such a large quantity been displayed for competition in this City.

Firewood.—From 6d. to 11d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is very dull, and the immediate outlook is not very reassuring.

Mealies.—The crop prospects on the whole are poor. Dry weather and high winds have produced a disastrous effect, and it is now too late for a complete recovery from these causes. Colonial grain is practically non-existent, and the demand is almost entirely supplied from the imported article. North American whites are quoted at about 18s. 6d. per muid.

Forage.—Is in fair supply at 10s. 6d. per 100 lbs.

Hay.—The new crop is scarcely ready yet. Small early lots are coming to market, but not in enough quantity to establish a fair quotation.

Potatoes.—The crop is none too good, but in the absence of any outside demand prices are easy, and rule about 7s. 6d. per 100 lbs.

Mabele.—None is offering, and with the havoc wrought by the aphid this season it is not expected that any quantity will be reaped.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1960, writes:—Our market has been rather flat this week. This has been caused by over supplying of some lines, as the demand sometimes is not equal to the supply. I daresay as soon as the mines start working again there will be as ready a sale for all produce as before the war.

Horses, mules, and donkeys are much cheaper now than last month. Good horses

are being sold under the hammer from £15 to £20, and it must be an exceptionally good horse that will realise £25. Mules go from £12 10s. to £20, and donkeys from £10 to £14.

Cattle are in demand, especially young beasts two to four years old, and heifers; last week some heifers realised £14 to £18. Cows were sold to-day £14 to £20, and six good trek oxen realised £108.

Sheep are also realising well. Wethers averaging 40 lbs. to 45 lbs., 28s. to 30s.; 50 lbs. to 55 lbs., 32s. 6d., 35s. There are enquiries for Africander ewes and Boer goat ewes.

Barley.—A fair quantity was offered, and sold from 20s. to 22s. 6d. per 163 lb. bag.

Bran.—Some indifferent samples were sold from 8s. to 9s. per 100 lb. bag, and good samples 10s. 9d. to 11s. 9d.

Chaff.—A good supply was sold, realising from 7s. 6d. to 8s. 6d. per 100 lbs.; this was a good sample.

Kafir Corn.—Some very poor and weevily samples were offered, and sold from 20s. to 28s. 6d. per 203 lbs.

Mealies.—Some medium Transvaal mealies were sold, 25s. to 26s.; American yellows realising from 26s. 6d. to 27s. 6d.

Oat Hay.—This, a very large supply, was offered and sold, realising from 8s. 6d. to 11s. per 100 lbs.

Onions.—Were in demand this week, a small supply realised over the week from 15s. to 19s. 6d. per 125 lb. bags.

Potatoes.—This line is stagnant. Simply no prices are offered, good samples being sold for 20s. to 23s. per 163 lb. bag; medium, 10s. to 15s. and 4s. 6d. to 8s.

Eggs.—5s., 6s. for fresh.

Fowls.—3s. 6d. to 5s. 6d.; ducks, 6s. 6d., 8s. 6d.; turkeys, hens, 7s. to 8s.; cocks, 12s. 6d., 15s.; geese, 7s. 6d., 10s.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of February, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same period from July 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Estcourt	95	55	3 55	12	2 00	13th	20 00	24 73
Nottingham Road	3 68	15	1 22	5th	24 71	24 72
Adamshurst	98	55	3 52	17	1 23	15th	15 74	25 35
Hilton	95	51	3 38	18	1 39	5th	19 00	30 71
Ixopo, Gorton	86	50	2 07	14	1 26	16 h	...	16 97
Ottawa	1 52	6	58	11th	21 79	...
Mount Edgecombe	94	64	2 34	14	71	23rd	23 50	36 03
Cornubia	2 03	...	...	...	25 68	36 52
Milkwood Kraal	1 70	...	...	...	17 57	27 94
Blackburn	1 93	...	...	...	22 80	31 14
Saccharine	2 25	...	...	...	23 23	33 55
Prospect Hall	1 90	...	...	...	20 17	25 06
Clairmont
Ekueefa	95	65	4 01	11	1 72	11th	24 74	33 53
Umsinto, Beneva	3 65	7	1 37	5th	24 38	35 77

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AND MINING RECORD.

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Mabele Aphis.

THE following notes have been supplied to the Government Entomologist by Mr. J. G. Fannin, Dalton:—

What I want to write to you about chiefly is the mabele aphis which turned up here this week, or was first noticed then. I think my mabele is too far advanced to be entirely spoilt, as it is heading now; but I notice the bottom leaves are turning red and withered. In your article in the *Journal* you mention a predaceous maggot, but speak of it as extremely rare, like all the parasites of these aphides. Now, here they are very plentiful, and I have been care-

fully observing what I suppose you mean by that term this afternoon, and I think have got the life history of this useful insect. I send you the two flies which I caught. The flies are easier heard than seen, being very quick in their movements. I carefully watched three different flies depositing their eggs among the clusters of aphides, and immediately looked for the egg, which is a small egg like an ant's. I watched some of these eggs hatch out, and saw the young grubs just hatched attack an aphis almost at once. These maggots are so plentiful that many

plants are quite clear of any but very small clusters, and the ground under the plants looks as though it had been sprinkled with meal from the empty shells of the aphides sucked dry by the maggots. The common brown ants I noticed also attacking these maggots, but unless the maggot pupates in the ground very few would get taken.

The maggots seem to be always plentiful here, and have always cleared off aphids when it has been bad before here on other plants. There are generally about ten of these maggots on each leaf at least, so with their voracious habit and quick growth they soon clear a leaf, and very soon I expect to find the aphids gone. A few years ago I had a dark green aphid attack the mealies here, and at first they promised to do a lot of harm, but this same maggot cleared it off very quickly. It has turned up again this year, but is eaten off as fast as it comes by the maggot. At Mr. Fyvie's this

green aphid is much worse, but I only saw a few maggots, and all small, among them. I also saw the lady-bird there, which I have not noticed here yet. There is also a pale green aphid as well as the dark green kind on the mabele, which all three kinds fancy, though the dark greens always confine their attention to the heads of the plants.

What has interested me rather is to see what a death-trap tobacco plants are to the flying aphid. Our tobacco leaves are speckled thickly with them, many dead, and others dying. If they once settle on the leaves they seem incapable of getting away, whether held by the stickiness on the leaves or by the hairs is hard to say.

The mabele aphid I noticed as far as Harden Heights the other day, and it seems to be spreading inland very rapidly. I find a few small clusters on the mealies, but they do not thrive there apparently, as only flyers and very young ones are to be seen.

Trout.

MR. J. C. PARKER, of Tetworth, reports, under date of 16th March, 1903, that, on the 10th inst., he caught an ordinary trout (farlo) weighing 1lb. 1oz. in the stream on his place. It was a female with spawn developed, a good looking specimen, hatched in 1900. A mile further up the stream, reports Mr. Parker, he caught a rainbow trout, a male, with milt developed, weight 1lb. 12ozs., length 16 inches, girth 9 inches. This was hatched in 1901. Mr. Parker says that this is interesting as showing the

rapid rate of growth in the rainbow trout. The trout hatched in 1901 were distributed in the following rivers:—

Oct. 6.—Umvoti (Mr. Geikie's farm)	700
Oct. 8.—Umsindusi (above Edendale)	400
Oct. 14.—Ipolela (Mr. Arbuckle's farm, about six miles above Trappist Station)	530
Oct. 14.—Government Stock Pond	50
Oct. 14.—Turned out on Tetworth	40

Pictures of Pedigree Stock.

IN response to a request made to the Port Elizabeth representative of Messrs. Wm. Cooper & Nephews when recently in Maritzburg, Messrs. Cooper and Nephews, the manufacturers of the well-known Cooper's Sheep Dip, have been

good enough to supply us with fourteen pictures of high class pedigree stock. In the present issue will be found the first of the series. To all the readers of the *Journal* we feel sure that the pictures afford interest or instruction, or both.

Local Oil Cake.

THE following letter from the Trappist Monastery, Mariannhill, confirms the information given in the last issue with regard to the local production of oil-cake :—

Replying to yours of the 14th inst., we beg to inform you that we have not made any oil cake for several

years. The nuts grown in Natal contain too little oil to make it worth while pressing for oil, and imported nuts are too high priced. We imported seed at one time from America, but in a few years it deteriorated ; since then we have not manufactured any oil-cake.

Suspension of Duty on Mealies.

ON the 18th inst. the subject of the suspension of duty on imported mealies was discussed by the Maritzburg Chamber of Commerce. The Chamber

came to the conclusion that, in the present state of the labour market, it would be inadvisable to advocate the suspension.

District Reports.

BULWER, March 14th.—Heavy rains have fallen all over this Division during the last fortnight, and on the night of the 13th inst. there was an exceptionally heavy fall of rain, and, in consequence, every little stream was flooded, and I fear it has done a good deal of damage in some parts of this District. Yesterday there was a most decided change, indicating the near approach of winter. In fact, I should not have been surprised at frost falling in the upper parts of the Division. I sincerely hope, however, there will be rain for six weeks or two months yet, otherwise it will be disastrous for the crops. The spring was so dry that all crops were planted late, and, though very backward, look exceedingly well, and if the frosts do not fall till the middle of May, there is every reason to believe the mealie crop will be better than last year. Hailstorms have been numerous in different parts of the Division, but in most places the mealies were not far enough advanced to be destroyed, but have been unfortunately further put back. In the vicinity of Dronk Vlei the fields have been washed away by the flooding of the Inkonso stream in many places. I was glad to hear the other day that the mealie crop is likely to be heavier this year than last. Stock of every kind seems to be free from disease. One case of Quarter-evil or Black Leg occurred in the village of Bulwer last week. It is the first case I have heard of in this part of Natal.

I understand it is almost unknown in this Division. Fruit has been plentiful this season, thanks to the hailstorms having taken other courses instead of Bulwer and its vicinity. The scale disease has been bad on the yellow peaches. On some trees the fruit has withered up altogether, especially in the Bulwer village orchards. Strange to say, the white peach has not suffered much from the scale, but has been affected by the peach-worm. Mr. W. H. Acutt, Magistrate of the Division of Underberg, passed through Bulwer to-day for Himeville, to assume the duties of the new Magistracy, to be proclaimed in a few days. During my absence on Branch Court duty at Underberg, on the night of the 24th February, 1903, a most dastardly and determined murder was committed on a European named S. B. Carlill, who was horse-breeding in a small way on the farm "Hilltop," about 13 miles from Bulwer, the details of which have already been fully reported in the public Press. The evidence obtained so far incriminates several Natives as the perpetrators. I need hardly say that the Europeans and Natives residing in the District have been very much alarmed by the atrocious act. Unfortunately the firearm used has not been traced ; every effort has been and is still being made to trace it, which has tended to increase the scare.

H. W. BOAST, Magistrate.

EMPANDHLENI, 28th February.—The weather has continued much the same as last month, warm and dry. Total rainfall was 1.67 inches. The maximum temperature was 92 deg and the minimum temperature was 58 deg. Things are in a serious state as regards the crops for the want of rain, they are all turning off white, and during the beginning of the month the aphid blight made its appearance on the mabele crops. This blight has been reported now as being prevalent almost all over the district. It is evident that unless we have very heavy rains almost at once, the crops will be a complete failure. The price of mealies is still £2 per bag, but the actual sales by traders during the month has been very small. No flying locusts have been reported. Hoppers are said to have hatched out in the Wards of the Chiefs Ndube and Sigananda in the low country, but no damage has been done by them. Two fresh outbreaks of Lung sickness were reported in the Wards of Nongamulana and Sitehit hile, but the disease appears to be in a very mild form. Rinderpest, I am pleased to say, is certainly on the decrease, and, with the exception of the Ward of the Chief Ndube, the district is almost clean. In this Ward the disease is bad, but this is due to the great difficulty there has been to get the Natives to have their cattle inoculated. The Stock-Inspector (Mr. J. R. Cooper) visited the district on the 6th instant, as well as Mr. Chas. Tyler, D.V.S., on the 19th instant. Mr. T. W. Cooper is at present in charge of the Rinderpest outbreaks, with three Native Inoculators, and is doing good work. The health of the District on the whole has been good, with the exception of the usual colds, etc.

C. C. FOXON, Magistrate.

LOWER UMFOLOZI, 7th March.—The weather during the month of February was terribly warm and dry. Rain only fell on eight occasions during the month, the heaviest fall being on the 10th. Crops suffered severely, and the opinion pretty generally expressed by Natives is that there will be little, if any, corn, mealies, amabele, and millet, to store this harvest. The Natives were recommended, however, to plant late crops on the off chance of the drought breaking, and it is understood many are doing so. Stock decreased by 147 head, owing to the Rinderpest. Seven hundred and fifteen head of cattle were reported as inoculated against the pest; 412 by Native inoculator Reuben, 134 by Native inoculator Oele, and 169 by the Rev. H. K. Leisegang, of Ubonambi Mission Station. In addition to the above, a goodly number of stock were inoculated privately by a Mr. Geo. Green, of which no report, as to number, was recorded at this office. Three rather serious grass fires occurred. The most destructive burnt down five huts out of a kraal of six, and melted £10 sterling in silver into a rather grotesque nugget, at present in the safe-keeping of the Magistrate, pending its disposal at a reasonable valuation. A supply of carob-bean tree (*Ceratonia siliqua*) seed was obtained from the Conservator of Forests on the 26th, and three or four seeds were given to several Natives, with instructions re soaking and plant

ing, 12 feet apart, at their kraals. Mr. H. J. Dunn, of Patane Store, was also given a few to plant at Patane and Nkwelana Stores; and between two and three dozen prepared holes were planted therewith at the new Magisterial premises at this seat of Magistracy on the 27th and 28th ultimo. It is thought the carob-beans produced in due course may—if the experiment proves successful—benefit not only stock, but human beings in times of drought and famine in these parts. Natives employed in abstracting the seeds from the dry, brown pods, on being told the pods were edible, started eating them with gusto, and consumed the bulk, remarking, truthfully enough, that they tasted sweet like sugar and ripe wild dates, and added, "Our children would enjoy such food at any time, let alone a time of famine!"

A. R. R. TURNBULL, Magistrate.

MAHLABATINI, 10th March.—The weather has been terribly dry, little or no rain having fallen during the month. The mealie crop is a total failure, and the mabele has been utterly ruined by the new parasite, a report on which has already been furnished. Owing to conflicting reports to the O.M. and C.C. on the grain supply, I am about to make a general inspection of my District, and hope soon to furnish a more reliable report for the guidance of the Government. The grain held by local storekeepers is considerable, and unless their charges are prohibitive, there will be no necessity for Government to come to the relief of the Natives; but I would recommend that a supply be stored in case of the storekeepers taking advantage of the scarcity of supply. One outbreak of lung-sickness was reported about three miles from the Magistracy, and the herd was promptly inoculated by Mr. Chapman, the local inoculator. I cannot close this report without commending the conscientious services rendered by this gentleman since his appointment. I feel sure that had he been appointed at the commencement the District would now have been free from Rinderpest.

A. J. S. MARITZ, Magistrate.

"The Burmese pony," says Mr. Nisbet in "Burma under British Rule," "varying from about 11½ to 12 hands 2 inches, and rarely 13 hands or more, seems naturally to take very keenly to racing. Seldom under any circumstances tender-mouthed, when once it has been raced it soon acquires iron jaws, and a strong tendency to bolt on the least provocation. Most of the ponies are now more or less of the Shan Hill breed. . . . Usually a keen, sinewy, mischievous-looking, high-withered, ewe-necked, little animal, the true Pegu pony was fleetest of foot, more iron-jawed, and harder than the bigger, sleeker, and handsomer Shan pony from the hills, with its thick, well-arched neck and its gentle eye. The Burmese hog their ponies' manes, but never clip their tails. With them a pony loses greatly in value if its tail is cut, while mares command a much less price than horses or geldings."

Pound Notices.

THE following stock, unless previously released, will be sold on the 15th April next:—

Howick.—Dun and white ox, branded E right hip.

Dundee.—Black mare, branded K right buttock, unbroken; light bay mare, hind fetlock white, off fore foot white with blue, in foal, branded K right buttock, unbroken; bay mare, branded K right buttock, unbroken; dark chestnut gelding, near hind leg deformed, white stripe on nose, near fetlock white, branded K right buttock, unbroken; black mare, wound on near front knee, unbroken; chestnut mare, with white star, branded left buttock S (in circle), unbroken; dark bay mare, off fore foot white, off hind foot white, no brands visible; cream gelding, white stripe on face, swelling on off front leg; bay gelding, white star on forehead, white hind fetlocks, branded off buttock JS; dark bay gelding, white mark under saddle, little white on both hind feet, branded near buttock [indescribable].

New Germany.—Black mare, with white star on forehead; bay gelding, with white after pastern. Both have Government brand, and are running on the farm "Waterfall," near Hillcrest.

Moss Dale.—Red cow, white belly, with down horns, left horn tip cut off, branded on right flank D-O.

Greytown.—Running on the farm "Fairview," Noodsberg, brown gelding, white saddle marks on back, condemned Government brand on left hip.

Richmond Road.—Light chestnut gelding, about 14 hands, fleabitten, small slit right ear, very long hoofs, both hind feet shod.

Pomeroy.—Running on the farm "Vergelegen," Umsinga, roan mule gelding, about 14 hands, condemned Government brand over f in circle on near flank.

New Germany.—Dark brown donkey stallion, no marks or brands visible; probable value, £6. The above animal will be sold at the expiry of one month from date (24th March) if not previously released.

Gold Luck, Dronk Vlei.—Chestnut stallion, slight white mark on forehead, tail cut at knees, scabby; probable value, £2 10s. The above animal will be sold at the expiry of one month from date (28th February) if not previously released.

Howick.—Dark brown yearling bull, strayed away with other cattle from the Howick Stock Fair; probable value, £8. The above animal will be sold at the expiry of one month from this date (7th March) if not previously released.

The following, unless previously released, will be sold on 6th May next:—

Panietersburg.—Brown gelding, branded W on off flank, aged, about 14.2; light bay gelding, black points, broad arrow on near rump, one

near shoulder, fresh brand JS near flank, aged, 13.2; red roan gelding, broad arrow on near rump, one near shoulder, aged, 14.1; red schimmel gelding, broad arrow near rump, R off shoulder, aged, 14.1.

Estcourt.—Running on the farm Pangawnia, at the kraal of Native Nongale, black ox, age four years, white back and speckled face and belly, branded on near side JU (the C or E is very faint); running on the farm Clifton, Madagascar ox, black, with upright horns, about five years old, no brands. Impounded by P. L. Strange, of Clifton.

Howick.—Black gelding, branded left shoulder //, condemned brand left rump.

Ndwedwe.—Two small dark brown pony mules, long tails, hogged manes, good condition.

Meran.—Jack ass (donkey), no brands, light grey colour, about seven years old; probable value, £4. Impounded by H. R. Button on the 11th. The above animal will be sold at the expiry of one month from this date (12th March) if not previously released.

AMENDED POUND NOTICE.

Dundee.—Dark bay stallion, small white star on forehead, off hind foot white, branded right buttock K, unbroken; probable value £10; impounded by N. R. Hesom on the 24th February. Bay stallion, black points, branded right buttock CB, unbroken; probable value, £9. Impounded by N. R. Hesom on the 24th February. The above animals will be sold at the expiry of one month from this date (12th March) if not previously released.

John Metcalf, the famous blind road maker, who took up that business in 1763, was a very remarkable character. He lost his sight from small-pox when only six years of age; but when he grew up, he was a great horseman, and used even to ride to hounds; he knew his way all over the country within many miles of his home, and he is said to have constantly ridden races. He was an excellent judge of a horse, forming his opinion of shape, etc., by his extremely delicate sense of touch; he would also judge of a horse's soundness of limb, when they were walked or trotted past him, his quick ear at once detecting any inequality of foot-fall. For a time Metcalf worked as a carrier between York and his birthplace, Knarborough. His was the first stage wagon to ply on that road, and he made the journey once a week in winter, and twice a week in summer. When he took up the business of road making, he went on his surveying journeys entirely alone, and his one tool was a long hooked staff.

Mid-Illovo Agricultural Society.

PRESIDENT'S ANNUAL REPORT.

THE following is taken from the annual report of the President of the Mid-Illovo Agricultural Society:—

Messrs. Vice-Presidents and Gentlemen,—I have to congratulate you, not only on your first show, but on the success of that show.

Many people outside the District were surprised at the exhibits, both in quality and quantity. All of us were exceedingly grateful that His Excellency the Governor came to open our show, which helped in no small degree to the day's success.

I think the drought that is being felt more or less throughout South Africa should emphasise the necessity of building light railway lines into the outlying corners of the Colony, as these corners (like our own this season) are often blessed with cooling rains, and would help a great deal in case of acute famine.

You will be very pleased to hear Mr. W. H. Allwright has again consented to be your hon. secretary. Your heartiest thanks are due to him for the very able manner your first show was carried through under very great difficulties, most of these difficulties being caused through lack of railway communication.

I am of opinion that our show should be conducted as much as possible from a progressive point of view, and that prizes should not only be given for the best bag of mealies, potatoes, etc., but other things, and I would suggest that prizes be given at our forthcoming show for things that will lighten the burden of our domestic animals and help us on our farms and in our daily life, and I will here mention a few things that I think prizes might be given for, with advantage to ourselves and the Colony generally.

1. For a far better and easier way of greasing wagon and cart wheels.

2. For an improved way of inspanning oxen.
3. For harnessing back oxen to wagons and carts, especially the latter.

4. A better implement for collecting mealies or other stalks.

5. For an implement for turning over the land about two inches deep, when the land is dry and hard in winter time.

6. For a pair of oxen to be driven with reins so that one boy only would be required when hoeing mealies, etc.

Our show last year was held on what I will term sufferance ground, and although our thanks are due to Mr. J. S. Mills for the use of that ground, it is, and always will be, a very great drawback to have to hold our shows on land that does not belong to the Society, and I think a very great effort should be made now to obtain our own ground and build an agricultural hall on it. I have no doubt if the whole matter were placed before the Government they would willingly double the amount of their last year's grant to the Mid-Illovo Agricultural Society. If the Government would do this I see no reason why a building should not be put up for this year's show. I feel sure land could be obtained in a suitable position where the railway station will be.

It is usual for agricultural societies to be represented at the Farmers' Conference, and I think ours should be.

With your permission I now hand over to the society a president's badge, on which is worked the motto of the society, "*Unitas, Progressus, Prosperitas*." Each year a streamer will be added with the name of the president on it, and I hope each successive president will work for the best interests of the society as I have endeavoured to do.

Agricultural Shows.

Himeville, Friday, 3rd April. Entries close 16th March; late entries 2nd April. Henry C. Gold, Hon. Secretary.

Greytown, Thursday, 14th May. Entries close 25th April. President, A. Kohrs. W. H. Gibbs, Hon. Secretary.

Ixopo, Thursday, May 21st, 1903. Entries close with Hon. Secretary on Saturday, May 9th. Fred. Thompson, Hon. Secretary.

Bulwer, Thursday, 28th May. Entries close 9th May. President, J. F. Alexander. Hon. Secretary, A. Brown.

Estcourt, 3rd and 4th June, 1903. President, H. Blaker, J.P. E. Cantherley, Hon. Secretary.

Umzinto, Thursday, 18th June. Entries close 13th June. Hon. Acting Secretary, R. G. Archibald.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries close 4th June; late entries 11th June. President, Sir T. K. Murray, K.C.M.G. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President, A. W. Cooper, J.P. Hon. Secretary, John Marwick.

New Hanover, Friday, 31st July. T. B. Train, Secretary.

Mid-Illovo, Thursday, 5th August. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 24th June. Secretary, W. E. Allsopp.

Marketing Cattle in Australia.

TAKING "fats" to market and bringing "stores" from the rearing grounds of the north to fatten on the rich pastures of the south, is the work of the Australian cattle drover. The grazier who has bought store cattle contracts with a drover to bring them to his station at so much per head, according to the distance to be travelled: for a mob of 500 bullocks, five men are taken by the drover, but for a thousand eight hands are enough. If the mob numbers as many as 3,000 head, it is divided into two. The average day's journey is twelve miles per day. There are always restless steers which persist of stringing out of the herd when it is rounded up for the night; when this occurs, the man on watch gallops steadily ahead, whistling or singing as he goes, and turns them back; if he rode quietly the probability is that he would startle some of the others, when a stampede would follow at once. Bushmen say that it takes exactly five seconds for a sleeping mob to become panic stricken; and when they are alarmed away they go, bellowing, at the top of their speed through the scrub. The watchman calls up one of his companions and they follow, but without attempting to check the mad rush, until the cattle steady down, for fear lest they should split up into small mobs, which are extremely difficult to handle. When they slow down, the men ride round and round them until they are quiet, and the rest of the drovers come up, and "hold the mob" thus till daybreak.

Store cattle are very nervous animals, and a very little noise will cause the stampede. The drover fears, above all, mishaps at night. The men will not even strike a match to light their pipes lest the cattle take fright. The "night horse," which is always kept saddled, shaking himself and jangling the stirrup irons; a kangaroo rat setting a wire twanging as he jumps through a fence, or any trivial sound will startle the whole mob, and send it racing blindly through the bush. If they are fenced in, or cannot stampede from any other reason, they "ring," galloping round and round in a circle; which is stopped by the men riding into the outer animals, and forcing them to take a new direction. Cattle will "ring" in water, and continue swimming round and round in a circle.

When the journey is a long one, special care is taken that the pace shall be that of the slowest animals in the mob. The chief object is to prevent any of them falling lame, which is most likely to occur on lands where there is much water lying, or there are many streams to cross, as their feet are softened and lameness is apt to follow. The passage of bridges, too, must be very carefully managed; although the bridges have protecting sides, the bullocks dread falling over, and crush together in the middle, when they are apt to tread on each other's heels, and lame one another in that way.

Weekly Rinderpest Report.

UP TO 17TH MARCH, 1903.

Krantzkop Division.

Amobonvu Location.—No deaths; no fresh cases.

Zululand.

Eshowe District.—21 dead; 34 sick.

Mahlabatini District.—11 dead; 9 sick.

Umlalazi District.—17 dead; 19 sick.

Lower Umfolozi District.—21 dead; 29 sick.

Nkandhla District.—32 dead; 34 sick.

Entonjaneni District.—1 dead; 3 sick.

Nongoma District.—1 dead; 5 sick.

Hlabisa District.—No report received.

Vryheid District.

4 dead; 9 sick.

Pauppietersburg District.

No deaths; no fresh cases.

S. B. WOOLLATT,

P.V. Surgeon

17th March, 1903.

Coffee in Trinidad.

MR. J. H. HART contributes to the *Agricultural News* of the West Indies the following interesting notes on some of the varieties of coffee grown at the Experiment Station, Trinidad :—

CONGO COFFEE (*Coffea robusta*).

Trees of this new coffee planted at the Experiment Station, St. Clair, have grown rapidly, and maintained excellent health during the past year. They are now bearing their second crop of berries, and the third show of flowers has just commenced to appear. This season there is a fine crop upon the trees, which will apparently be much later in ripening than other species of coffee. The clusters of berries are in whorls, many of them forming a circular ball completely round the branch. The name *robusta* appears to be fully justified by the luxuriant growth which it makes, and there is every indication of its becoming a most useful coffee for low elevations. It is reputed to have a very fine flavour, and the crop now ripening will enable us to

speaking more definitely on this point in a few weeks time.

HYBRID COFFEE.

The numerous plants of hybrid origin raised from seed of the West African *Coffea stenophylla*, grown in proximity to a clump of Liberian coffee, are now fruiting for the second time, and fully maintain the characters which appeared last year. They promise to give a strain of coffee possessing strong vitality, and will probably be found suitable for cultivation where the Arabian varieties refuse to thrive.

So far there is no appearance of leaf disease of any kind upon them. Happily the virulent *Hemileia* has not as yet found footing with us as a West Indian pest; but the Arabian varieties suffer at times, though not severely, from the attack of *Cercospora coffeicola*. Even from this disease, up to the present, both the hybrid varieties and *Coffea robusta* have been exempt.

Jamaica Mealies.

THE *Queensland Agricultural Journal* says :—"Over a year ago, according to the Secretary of the Queensland Acclimatisation Society, it was suggested to him by Mr. John Stennett, of Elliott Brothers, that he should import from Jamaica some seed of a variety of maize that was growing there; he thought this maize would be suitable for growing in our Northern districts where the ordinary maize did not do well—not that it did not grow well, but being of a soft nature it did not keep well in the damp climate of the North, and was, moreover, subject to attacks from the weevil, whilst the Jamaica variety, by reason of its containing a larger proportion of gluten, was hard, and was found to stand the climate. This suggestion was carried out, and some of the seed was distributed. One result is shown in a letter

from Mr. S. W. David, of the Mulgrave (and known to many Ingham residents), to the secretary of the society referred to, and from which we extract the following :—"I am sending you a small sample of corn grown from the corn given me by our overseer when up here. I planted all the seed in my garden, and the resulting crop I gave to two of four farmers, who planted it on their farms. The sample I am sending you is not a picked one, as the farmers had saved the best for seed. They are highly pleased with the corn, and are going to plant a large area with it. The cobs were nice and clean, and free from all disease; grain hard and even. An exhibit of this corn will be most likely sent to your Brisbane show. It seems particularly suited to this climate."



EDWARD RYLEY, Esq.,
The First Minister of Agriculture.

The First Minister of Agriculture.

IN this issue we have the pleasure of giving a portrait of Mr. Edward Ryley, the first Minister of Agriculture in Natal. Under the previous form of government as all know, there was no special department for agriculture.

In 1890 Mr. Ryley entered the arena of politics; he was returned in that year as member of the Legislative Council for Ladysmith. He and Mr. John Bainbridge stood on the Responsible Government platform, the defeated candidates being Sir Thos. K. Murray and Mr. W. C. Bester. In 1892 he and Mr. Bainbridge were again returned; Mr. G. F. Tatham and Mr. Ignas de Waal were the unsuccessful opponents. In the year following there was another election, and Mr. Ryley was again returned, having for colleagues Mr. Bainbridge and Mr. H. H. Smith.

For some time—until the abolition—Mr. Ryley was a member of the Council of Education. Mr. Ryley was chairman of the 1894-5 Stock Commission, on the recommendation of which the present Veterinary Department was established. To this Commission is also due the Lung-sickness Act of 1897.

In February, 1897, Mr. Ryley, at the invitation of the late Mr. Escombe, joined the Administration as Minister of Agriculture. All the energies of the Department at that time were directed to the keeping of Rinderpest out of the Colony. The efforts were unsuccessful. The first case occurred amongst some Kafir cattle near Dundee. The several herds were killed and paid for. The next case oc-

curred at Mr. Field's farm near Ladysmith, and other cases broke out almost simultaneously in different and widely separated parts of the Colony. It was then decided that the destruction of herds would not be practicable, and on the advice of Mr. Watkins-Pitchford inoculation with bile, until serum could be obtained, was introduced. Mr. Ryley immediately took steps to get salted cattle both from the Orange River Colony and the Transvaal. Unfortunately, owing to the season being midwinter, the cattle were in poor condition, and could not be bled for a considerable time. At the election of 1897 Mr. Ryley was rejected by the Ladysmith electorate. He then took a three years' holiday to England.

During his tenure of office, the whole attention of the Department being centred on Rinderpest, Mr. Ryley could devote barely any time to other agricultural needs. The officers of the Department were then engaged from early in the morning till late at night. The expenditure amounted to £176,000; in the Cape Colony the corresponding expenditure was £1,744,000. These figures will roughly indicate the immense pressure of responsible work that must at that time have fallen on the shoulders of one in the position of a Minister of Agriculture.

Mr. Ryley's father was a farmer and miller in England, and he himself, until he came as a young man to the Colony, was engaged with his father in farming. In Natal Mr. Ryley's occupation is that of miller and timber merchant.

Mangoes.

A COAST correspondent has asked for information concerning the varieties and the cultivation of mangoes. As such information may be useful to many fruit growers, it has been considered advisable to publish the following ex-

tract from Watt's Dictionary of the Economic Products of India. The author was Mr. Maries, of Darbhanga, an expert on the subject of mangoes:—

Origin.—The cultivated mangoes of India have arrived at a great stage of

perfection, and consist of very numerous races, although these are unknown to most people, except as Bombays, Lunglehs (Lengrahs), and Maldas.

The many dozens of sorts sold in the bazaars under these three names have given the idea that there are only three kinds of mangoes fit to eat. These three names really represent three distinct strains of cultivated fruits. It is interesting to note the changes that have taken place in these fruits. The form or shape has continued almost the same as that of the wild varieties, but the flavour has developed from "taw and turpentine" to something too exquisite to express in words, each good variety having a flavour of its own. On examining, for example, the outline of the Kangra varieties, one notices the true shape of the Bombay "afooz," one of the finest mangoes; also in the Tirhoot mangoes one sees a great similarity to a sort called "Kishunbogh." I have seen two types of wild mangoes, one very variable from Kangra, and one from Sikkim, but these may be viewed as manifesting the two great shapes of cultivated mangoes.

Improvement by Selection.—The latter wild sort is evidently the progenitor of the Malda cultivated varieties; the Kangra form might naturally be viewed as the ancestor of the Western Indian sorts, but these two wild varieties almost unaltered have been met with under cultivation in Tirhoot, and they produce all the different families of cultivated mangoes, as the result of accidental or artificial selection. Till recently mangoes were always planted from seedlings, and even now this is frequently the case. When the trees fruited, the good sweet ones were allowed to grow, while the sour and worthless were cut down and used as firewood. In this way selection took place, and is going on at the present time at Tirhoot and Northern Bengal, and I suppose in other Districts. The intercrossing of the flowers of the primary races has produced innumerable sub-varieties of fruit of all sorts, sizes, and quality, only the best of which have been grown and propagated to any extent.

Propagation.—Mangoes are propagated by inarching, that is, grafting by approach. They can be grafted in other ways, but inarching is the simplest. They can be also grown from seeds. In fact, if only the finest and best sorts be selected, the chances are that 50 per cent. will be as good as the fruit sown, a few better and the rest worse. I should advise planting seedling mangoes, where grafts are difficult to obtain, taking for the seed only such sorts as *Afooz Puary*, *Kishunbogh*, *Durbhungah*, *Bombay*, *Fuzlee*, and good forms; and then only from well-formed quite ripe fruits. The season of ripening too might be prolonged if such kinds as *Rhori Budaya Mohur Thakoor*, and other *Budaya* sorts were used for seed. This was done in rather a large scale in Durbhungah. A good mango seed should never be thrown away, always plant it if possible.

Soil and Cultivation.—Mango trees grow everywhere in the plains of India. The home of the tree in the Himalaya is from 1,000 to 2,000 feet. It seems to grow as well in a swamp as on a bund, but the best fruits and finest trees in the plains are always produced on trees grown on raised ground. The soil does not seem to interfere much with the tree. In Bengal it grows equally well in a rich deep river deposit, in clayey or in sandy soil. In Gwalior we have fine trees in *kankar*, with enormous crops of fruit. The best place to plant mangoes is on a raised, well drained piece of land, with a good depth of soil. When the trees are young the land between them should be well cultivated every year, and round the young trees the ground should be dug up and stirred frequently. When the trees are about 10 feet high, the ground for a space of 10 or 12 feet all round should be dug up in January or February and manure well mixed with the soil. In Bengal, where irrigation is not generally necessary, this manuring would be best done after the fruit has been gathered. In Central India I do it in February. Where mango trees are irrigated, as they are in Gwalior, Allahabad, and other similar localities, no water should be given after the rains to fruiting trees; allow the plants to dry

up and get well ripened. If this be done, a crop of fruit every year will be the result. Our trees are about 20 feet high. We do not irrigate after the rains. We dig up and manure the ground around the trees in February, and when the fruit is set we water from a well every eight or ten days, till it becomes ripe and the rains begin. This treatment has been carried on for two years. We had a good crop last year; this season we have an enormous one. If irrigation is carried on all the year round, the flowering season is brought on prematurely, the flowers are deformed, and become large masses of leafy flowers that hang on the trees for months and produce no fruit.

Planting.—The best time to plant mangoes is in the rains—in July. The native method of growing plantain trees round them is very good, but instead of planting one or two for "luck," I grow four or five for shade and protection, taking them out when the mango tree is strong enough to stand the climate. In laying out a plantation the trees should be put at least 30 feet apart. The holes for planting should be prepared six months beforehand, dug up well, and a little very old manure mixed with the soil.

Cultivated Races.—Of cultivated sorts of mangoes I have collected upwards of 500, and from these have selected 100 good ones. Mangoes may be obtained to fruit in succession, from May till November. Thus the Bombay *Afooz* fruits in May. The *Kuabogh* of Tirhoot also does so, while the *Budayas* and *Kailkees* fruit in September to November in Tirhoot and Malda. In 1885, in Durbhungah, I had mangoes every day for five months. In that year a list of fruits was selected and grafts were made of all. These were grown in model plantations. One plantation of about 125 trees was selected from stock derived from the Madras Horticultural Society, Calcutta nurserymen, Chanchal estate, Malda, and Bombay. The sorts planted were as follows:—

Madras.—Peter mango, Goa, Mulgova, Komaine, Ameercola, Dilpusund, Wallajah pusund, Office pusund.

Malda.—Fuzlee bewa, Bura jalli bund, Chota jalli bund, Latcuspu, Mohunbogh, Lumba budaya, Dilshoj.

Durbhungah.—Kuabogh, Durbhungah-Bombay, Gopalbo. h, Kakoria (cucumber mango), Gobinpoor-ka-Sinduria, Khupurwa (camphor). The melon mango, peculiar to this district, is known as the Naroi-ka-kerbuza, Mohidinugger kerbuza, Dhoola walla kerbuza, also Nursinghbogh, Maharaj pusund, Deruna, Kishenbogh, Gowrays, Bhoopolie, Kurrelna, after the fruit Kurela and many others.

Bombay.—Pieary, Afooz, Salem favourite.—In laying out a plantation of mangoes, the trees should be so arranged that the season of ripening comes in order; the early mangoes planted to the east, medium mangoes in the middle, late mangoes, west. In the large Durbhungah plantation, of about 65 acres, there are three sections arranged as above.

The following descriptive list of good sorts of mangoes may be found useful. It is referred to five sections:—

1. *Afooz.*—This is the celebrated Bombay mango, a lovely orange colour, with reddish flesh. It is really not a Bombay fruit at all, but probably came originally from Salem. Absurd prices are often paid for this fruit, as much as 60 rupees per 100 being given by dealers. Like most mangoes this should never be eaten fresh, but should be gathered ripe from the tree and laid upon a shelf for a few days to fully mature. Weight, 8 to 12 ounces.

Kuabogh.—A Tirhoot mango, of which the quality is as good as the finest Afooz. It is a small green fruit, and ripens early. The name signifies "crow's food." It weighs about 4 ounces. Season, May.

Durbhungah-Bombay.—This is the Bombay of the up-country gardens, and about the best mango. A very old plantation exists at Norgona, Durbhungah, and another called the Lakh Bagh, near Somasapur, had once upon a time a lakh of trees, said to be of this kind. Season May, June.

Safada.—A Malda sort. This is the celebrated Malda ~~kind~~ said to be equal to the Afooz. It hangs till late in June,

and is a superior fruit. It is very like Durbhangah - Bombay, but smaller. Weight, 6 ounces.

Kakoria (cucumber-plantain).—Very like a cucumber, often 7 to 10 inches long, by $2\frac{1}{2}$ inches wide. A most luscious, refreshing fruit. Weighs from 10 ounces to 1 pound. It is a plentiful variety in Tirhoot, but is seldom gathered in good condition, and is often sour. When gathered ripe from the tree, and kept for a couple of days, it is a perfect fruit.

Kurrelna.—Named after Kurela (Momordica). This is a variety of the cucumber mango, smaller and covered over with greenish warts like a Kurela fruit. It weighs 8 to 12 ounces. Season, July.

Banka, that is, "twisted." This is a large green fruit, totally unlike any mango I know. It is twisted, weighs 1 pound, and has a strong flavour. It is a very rare sort. Season, July.

Ameercola.—Madras fruit; weighs 10 ounces, has a rough skin like an orange, a very peculiar shape, and very distinct. Season, July.

Dilpusund.—Several fruits bear this name, and the one I received from Madras is like the Durbhungah, *chupki* (flat) or *chupra*. It is a desirable fruit, and very good looking. Season, July.

Durma or Derrima.—From Lawanie Tirhoot. The true sort is one of the finest of mangoes. It varies in size from 8 ounces to 1 pound, and is a round, yellowish fruit of most exquisite vanilla-like flavour; the flesh is rather hard, but melts in the mouth. There is another variety of this, a red fruit, which at first sight might be mistaken for a Blenheim orange apple. Season, June and July.

Kishenbogh Durbhungah.—A celebrated fruit, which, since the railway has been opened, is sold with Gowraya Malda by thousands in the Calcutta markets. It is a round, fat mango, of first rate quality. Season, July.

Kishenbogh.—This fruit often hangs on the tree till the seed germinates inside. I have had several examples of this, in which the young plant has grown

completely out of the fruit. The flesh of the mango in these cases had become quite hard, and tasted like a carrot.

Lerrua or Lerrna.—From Laddu, a sweetmeat. This is the most beautiful of all mangoes, the mixture of orange red and green, in stripes and blotches, resembles the colouring of a ripe apple. Season, July.

Shah Pusund (generally called Malda).—A fine large, irregular shaped fruit of fair quality, large grown as it is hardy, and a good cropper. Some of the fruits weigh 2 pounds. Season, June and July.

Gowraya Malda.—A Tirhoot mango, also called *Safada Malda* and *Tikari*. A good specimen of this is one of the finest mangoes in India. It cannot be mistaken. It has an aroma and flavour distinct from those of any fruit I know. The skin is thin as writing paper, and the stone so tender that, when cut, the knife often goes through it. There are many forms of this race; the best I have named after Mr. Buckley, as Buckley's Gowraya Malda.

Kumukht.—The skin of this is rough and leathery. It is a very irregular shaped round fruit, often with the pistil scar or "Nak" developed in a most curious way. A fine flavoured and rare fruit. Season, July. Weighs 8 ounces.

Buhpali.—A small ovoid mango, often perfectly crimson, vermillion, and yellow in colour, perhaps the best of all mangoes. I have obtained it from several places in Tirhoot, but always of the same fine quality. Season, July. Weighs 6 ounces.

Inerna (meaning spontaneous).—This is the largest mango, some specimens attaining a weight of 4 pounds. It is of good flavour, but is a rare fruit. Season, July and August. It came up from seed in a native gentleman's garden in Durbhungah, and only one tree was supposed to exist.

Nursingbogh.—A blue mango, weighing $1\frac{1}{2}$ pounds. It can be readily distinguished by its leaf, which frequently is as much as 18 inches long. Season, July and August. A good fruit.

Maharaj Pusund.—A Tirhoot fruit of fine quality, though common and well known. Weight, 6 ounces. Season, July.

II. *Kerbuza Mangoes*.—We come now to a distinct class of mangoes called the Tirhoot kerbuzas or melons, from the musk scent they possess. There are three good kinds, all of which are of fine quality, and ripen late in July, *Naroika kerbuza*, *Mohedebugger kerbuza*, and *Dhoola walla kerbuza*; all three should be in every collection.

III. *Budayas*.—The above mangoes are generally all over by the end of July, but sometimes hang till August. The class of mangoes called Budayas and Maldas (true) have all peculiar shaped fruits, and seldom ripen before the middle of July, and with care and protection will keep till October. These fruits may be seen hanging on the tree in October, protected by little bamboo baskets from wasps, birds, etc. In 1885, I had some fruits gathered fresh from the tree in excellent condition on the 30th October.

Khari Budaya.—Ripens first. Season, July-August. Weighs 8 ounces.

Terha Kellua (the crooked plantain).—Always a long, ugly fruit, with the stalk on one side, hence the name. Weighs 1 to 1½ pounds. It comes from Chanchal, in Malda.

Fuzlee Bewa.—The large mango one sees in Calcutta, weighing 1 to 2 pounds, very common in the bazaar there in August. These fruits sometimes fetch as much as one rupee each.

Jalli Bund (seed in a net).—Because after the skin has been taken off the flesh appears to be in a yellow thread net. This flesh appears to be in a yellow net. This is from Malda, and is an excellent fruit. Season, August and September. Weighs 1 to 1½ pounds.

Durbhungah Budays or *Souria Budaya*.—A very first-class mango, flattish and good looking. It has no fibre, a very thin skin, and a small thin stone; ripens August. Weighs 10 ounces to 1 pound.

Nukkna Lungra.—So named because the pistil scar develops into a prominent nose-like projection. This is a Durbh-

ungah mango, and is a very good sort. Season, August and September.

Mohunbogh.—From Malda and Monghyr. A very large, round, and irregular shaped fruit, 1½ pounds in weight, of fair flavour.

Mohun Thakoor.—One of the latest and best mangoes, very ugly and very irregularly shaped. They hang on the tree till October. Weight, 1 to 1½ pounds.

Tars.—The native name of the Borassus palm. This mango is just like the fruit of palm of the same name. It weighs 1 to 1½ pounds, is good eating, and ripens in September.

IV. *Barramassia* (meaning twelve months).—There are several varieties of the perpetually fruiting mango, none very good. They are grown more as curiosities than anything else.

V. *Luttea*.—The creeping mango.

This is really not a creeping mango, but a decumbent variety, produced by grafting. There are several varieties of it. Mr. Chatterjee, the Calcutta nurseryman, has one variety that grows along the ground and bears small roundish fruits. Another is trained on a *machan*, and bears large fine-shaped fruits. It is a true mango, and a cultivated sport. I have had samples of fruit of *Luttea am* from Tirhoot, and they prove to be *Shah pusund* and *Dhoola walla kerbuza*. I am informed these two trees were originally staked and trained down to the ground, and bore fruit in this way. After a considerable space was thus covered, eventually the training ceased, and the trees at once grew up and formed straight stems.

Mr. E. Barrett, writing to the *Field* in 1863 on "Animal Food for Horses," referred to a silver tankard "won at some west-country races by a broken-kneed, goose-rumped, cat-hammed cob we used to have, all through a drop of beer before starting, the only thing he had in the way of preparation—he completely distanced his competitors in both heats of two miles. This pony's wind was most extraordinary; give him a pint of beer and a pound of oatmeal and you could gallop him 12 miles in 45 minutes in harness up hill and down, without whip or force of any kind. He was the most uncared of animals in existence; he would be content to eat out of the pigs' bucket or any other man's platter. Nothing came amiss to him."

Correspondence.*To the Editor Agricultural Journal.***PRUNING FRUIT TREES.**

DEAR SIR,—Mr. Sim's article and Mr. Hopene's letter on this subject in your issue of the 6th inst. ought to convince fruit growers that pruning is a necessity. Nature is kind in this country, but it is quite immaterial to Nature whether she produces wood, leaf, blossom, or fruit; it is not only material but needful to the fruit farmer that the latter should be produced, and that of the best quality.

If a child is expected to be a credit to its parents, and a useful member of society, it must be trained early. A fruit tree or vine taken in hand in early life becomes not only useful but ornamental, for I maintain that when a tree is properly pruned it is symmetrical in shape and pleasing to the eye. Nearly all the trees in Natal have a tendency to overload themselves with their own seed, but the market requires pulp, not kernel.

The citrus tribe require but little pruning, and oranges, naartjes, limes, etc., should always be allowed to grow as many branches as they will near the ground, provided the branches are not dwarfed nor interlaced, or are actual suckers.

Deciduous trees should have their branches shortened back when transplanted, and shortened to a greater or less extent every winter, no two branches should be allowed to grow from one "eye" or joint, and the tree should be opened out so that the sun's rays may penetrate to the stem, and if really fine, heavy and luscious fruit is desired prune severely. Witness the espaliers in Old England and the heavy crops obtained from dwarfed trees. The instance that Mr. Sim gives of fruit growing on trees 70 feet high horrifies me—an English or Scotch gardener prefers 7 feet to 70 any way. Pruning is simple, yet it is an art. Mr. Sim is quite right when he says that the thumb nail can do a large proportion of the pruning which a tree requires. Watch for the suckers and superfluous young shoots and nip them out by the socket.

Pruning is a white man's work, though both coolies and Kafirs could be trained to it, but, if left to themselves, they will cut perhaps an inch away from the main branches, which inch will crowd the tree in a very few weeks with any quantity of young wood. Cut close, and the knife should only be used during the winter months, but nipping ought to be practised on the young wood before the shoots are 5 or 6 inches in length.

Of course everyone knows that to prune ripe wood when a vine is in leaf would result in the vine bleeding profusely, and possibly fatally, whereas vines, if well fed, *i.e.*, manured, require any amount of green wood either nipped out or shortened back.

During the palmy days of coffee planting, we obtained large crops by keeping the shrubs down to 4 feet in height; and pruning so as to leave secondary and tertiary branches in symmetrical form on the primary branches, but the tree rebelled against this treatment, and systematic "nipping" became necessary, or, as we called it, "handling." No knives were allowed for these second and third prunings.

The Japanese plums seem to me to require blossom pruning, or the removal of much young fruit while it is "setting." I am afraid this generation of Natalians will not be able to bring themselves to see the importance of learning how to prune ripe wood, green wood, fruit, and root; they will not risk losing "the sprat to catch the mackerel." If such an animal as a thorough English or Scotch gardener, who understands our soils and climatic conditions, can be found in Natal, I advise our fruit farmers and amateurs to consult him.—I am, etc.,

WM. LISTER.

Zwaartkop Valley.

P.S.—My remarks, of course, apply only to fruit grown on suitable soils, and with good cultivation.

Garden Notes for March.

By W. J. BELL, Florist and Seedman, Maritzburg.

THE main sowings for the winter crop of vegetables should be put in this month.

Except in the very coldest parts of the Colony the following seeds may now be sown :—

Broad Beans, Brussels Sprouts, Beet, Cabbages, Carrot, Endive, Lettuce, Mustard and Cress, Onion, Parsley, Parsnip, Raddish, Salsafy, Spinach, Turnip, Savoy, Kale, Kohl Rabi, Brocoli. Peas may still be sown for winter where frost is not severe. In the colder districts they may be sown about two months later for a spring crop where water can be led on. All kinds of culinary and medicinal herbs may now be sown, such as Thyme, Sage, Marjoram, Savory, Basil, Borage, Lavender, Rosemary, Rue, and Wormwood.

Where only small quantities are required it will be found advisable to sow in boxes, using nice light soil, not too rich, and care should be taken not to keep the soil too wet, especially for the Thyme and Lavender. The latter thrives best in a poor dry soil when transplanting from the boxes, and will not succeed in damp, shady places where parsley, for instance, would thrive.

For a shady border Parsley makes an excellent edging for the kitchen garden, and for a dry exposed position Thyme will serve the same purpose. When utilised for this purpose the plants should not be allowed to flower and run to seed. Prevention of this by frequent cutting will prolong the life of the plants, and at the same time keep the edging neat and tidy. All the finer seeds should be shaded with some kind of light litter immediately they are sown, until the seedlings are well through. Neglect of this is often the cause of failure, and the seeds are blamed. The shading serves several purposes, protecting the tender germ from the intense heat, con-

serving moisture by preventing evaporation, and also preventing baking and hardening of the surface.

Change the crops from place to place so as not to grow the same things on the same plots two seasons in succession. This rule, though of great importance, cannot always be strictly followed, and may be neglected frequently where the land is constantly and heavily manured. It is, however, of more importance in connection with the potato than any other vegetable, and this should, if possible, be grown in a different plot every year, so that several years shall elapse before planting again on the same ground. Sow everything in drills at the proper distance apart. Crops sown in drills can be thinned, weeded and hoed between much more easily and efficiently than when broadcasted.

All drills should be sufficiently far apart to allow for working a hoe between them without injuring the crop.

The planting out of Celery should be completed as soon as possible.

Late plantings of Cauliflower should be put in the trenches same as Celery; all the moisture is then conserved round the roots and they will then succeed as well as the earlier plantings.

Continue to plant out Strawberry plants where required, choosing suitable weather for the operation.

FLOWER GARDEN.

All varieties of hardy flower seeds may now be sown for winter and early spring flowering.

For winter flowering the following are most suitable :—Mignonette, Pansy, Phlox Drummondii, Sweet Alyssum, Candytuft, Petunia, Calendula, Dianthus, and Ten Week Stocks. For early spring sow Poppy, Sweet William, Gaillardia, Coreopsis, Eschscholtzia, Cornflower, Clarkia, Larkspur, Antirr-

hinum, Aquilegia, Sweet Pea, Wall-flower, Forget-me-not, Primrose, Cowslip, and Polyanthus. The last three should be sown in boxes for transplanting.

If several varieties of Poppy are required it is best to sow them separately, as they vary in height, and when sown in a border in clumps the Shirley Poppies should be in the front and the Oriental at the back, as the latter grow to four or five feet. This is the best time to sow the Mexican Poppy. This is a new introduction to Natal, and promises to be one of the most useful and free flowering perennials one can have in the garden. The foliage is similar to

the Eschscholtzia, but the flower is quite distinct and paler in colour.

Except in the hottest weather the flowers keep fresh when cut from three to five days, if the water is changed occasionally.

Chrysanthemums should be staked and tied up and kept well watered in dry weather, and as soon as the buds begin to show, clear liquid manure should be applied about twice a week. The best way to make the liquid manure is to half fill an old sack with fresh horse dung, put in some soot if possible, tie it up securely, and put into a tub, fill up with water, and in a few days it will be ready for use.

The South African Yoke.

By the DIRECTOR OF AGRICULTURE.

THE article on "The South African Yoke," which appeared in the *Agricultural Journal*, No. 21, of 19th December last, has called forth some interesting letters on the subject. Chief amongst these was one from Mr. J. H. Lilienthal, who wrote from Reinfeld, in Holstein, and forwarded a German catalogue containing numerous illustrations of ox harness. These illustrations are both interesting in themselves and necessary for a proper appreciation of Mr. Lilienthal's letter. Blocks have, therefore, been prepared from the more important of them, and prints from these will be found on Plate. Some delay has occurred in publication owing to the fact that the catalogue arrived by a late mail, and, of course, time was needed for preparing the blocks. Mr. Lilienthal's letter was as follows:—

MR. LILIENTHAL'S LETTER.

A. N. Pearson, Esq., Director of Agriculture, Maritzburg.

Sir,—With the greatest of interest I read the article "The South African Yoke" in the *Agricultural Journal* No. 21, which came to hand last week. I

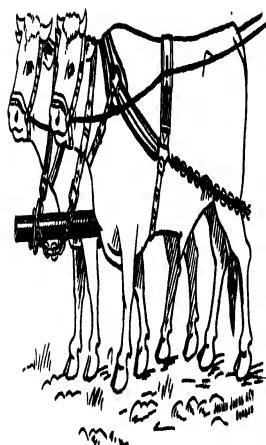
made a trial with oxen in harness last season before I left for Europe.

I started farming in Natal in the beginning of 1897; eight oxen which I purchased died of rinderpest the following spring. The work done up to that time I found to be quite inadequate in quantity and quality. The deficiencies of the yoke mentioned in the above article, and the carelessness of the Kafirs inspanning, made almost continual readjustment of neckstrops and reims during the work necessary. In Australia I had seen teams of 16 oxen yoked up, worked, and unyoked by one man alone; in South Africa usually two or three Kafirs were required. This bad system of yoking was one of the reasons that I started with horses. With three medium-sized horses worked abreast I got over more land and did superior work than formerly with eight oxen. All through the horses gave every satisfaction, but the difficulty came in when putting on more horses to work. Kafirs to be trusted with horses were almost unobtainable, and the short duration of engagement of most of the boys was another drawback. Subsequently I started with oxen in harness. With this I forward an illustrated cata-

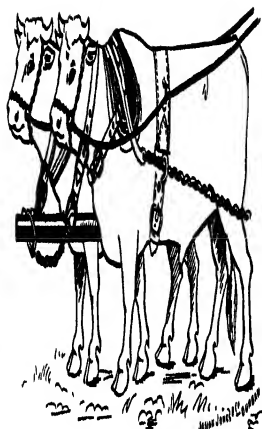
OX-HARNESS.

PLATE.

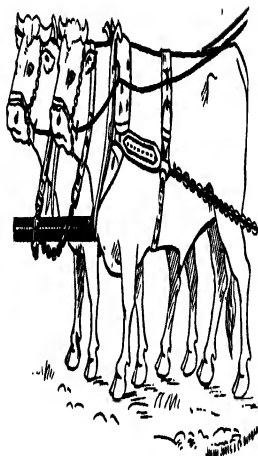
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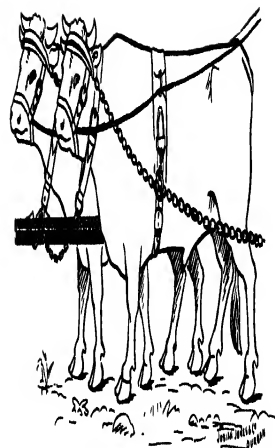
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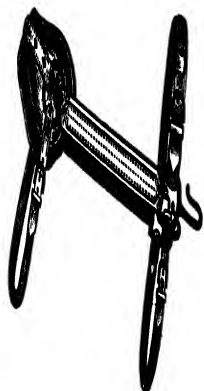
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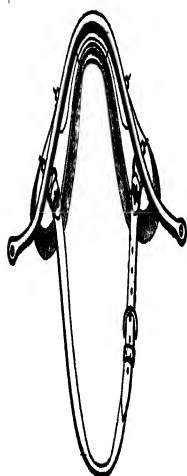
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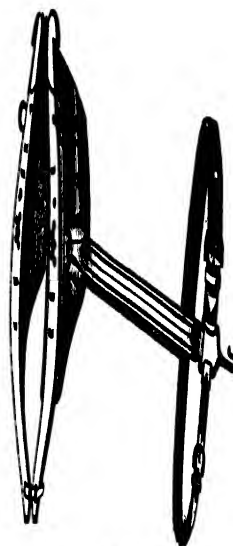
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No. 61.



No. 63.



No. 28.



No. 29.

logue published by the manufacturer from whom I bought my harness.

No. 56 (see Plate, Nos. 56 and 62) was chosen by the maker for my purposes, with the remark that it had proved suitable in other parts of Africa. The illustration shows a cushion over the back of the neck in the same place where the wooden yoke would be, with the difference that it covers at least three parts more of the body than the yoke, as the draught is always laid on to the shoulders. The buckled neck strap keeps the cushion in position and does not choke in the least. I have pushed my arm repeatedly through it when the ox was pulling.

No. 57 is similar to the above, but may not adjust itself so well over neck and shoulders, as the strap over the neck cushion is in one piece.

No. 58 (see Plate, Nos. 58 and 65) collars may have the advantage of covering more of the shoulders, but do not fit over ox as well as the former.

No. 59 of wood must have an advantage over the yoke. It covers more of the body, and the principle with all harness, that the ox can walk more at his ease unconnected by a stiff piece of wood to his mate, is observed. Wood will perhaps give an ox sore neck sooner in rainy weather than cushioned leather; also, indeed, in dry weather.

No. 60 (see Plate, Nos. 60 and 61).—The bar over the neck cushion is, no doubt, an improvement; the catalogue states it has to be righted by a blacksmith if not fitting the ox.

No 66 shows a single ox in a tip-cart.

No. 67.—A new patented collar which, in my opinion, would be too complicated.

Nos. 26 and 27 (see Plate, Nos. 26 28, and 29).—Even more noticeable than the neck harness (56 and 57) is the harness with draught from the forehead used in Germany. The illustration shows that a piece of iron-plated wood, padded inside, is strapped to the horns of the ox in front of the head, and the traces are attached to this piece of wood. I believe that climatic conditions in South Africa would be against

this kind of harness; besides, an ox accustomed to the South African yoke will take sooner to collar, or neck harness.

The oxen are either both guided with reins or the left ox only, and the right ox tied to the former with a chain (No. 55) to the back band. No bridle or bit is used; only a headstall with a sharp iron above the nose (Nos. 44 and 45). The oxen I used in Natal had been broken in to the yoke; they took at once to this guidance—much quicker than an unbroken horse will.

Ox harness will cost no more than harness for horses. The stuffing will not wear out as quickly, as the ox does not sweat.

As I have already said, I worked my oxen only a short time, owing to my early departure, so it will be little use for me to make statements. But I have before me the year-books of the German Agricultural Union, which holds a show every year in larger towns: the district is changed each year in order to give agriculturists all over the Empire an opportunity to visit it once in the course of time. Trials of draught power of oxen and cows are made every year. Below are a few results which I have extracted. I shall only state weight of animals, load, etc., and not give the names of breeds in competition, for it has been proved that draught-power is not a matter of breed so much as individual adaptability, training, etc.

Show, 1896, Stuttgart-Cannstatt.

For trial there were twenty-one couples of oxen and eight couples of cows. The weight of the oxen was from 1,207 to 1,680kg. (24 to 33½ cwt.) per pair, that of the cows from 858 to 1,589kg 17½ to 32 cwt.) per pair. The animals were in neck and forehead harness. The wagons used were of 900kg. (18 cwt.) weight, with tires 8cm. (3 1-7th in.) wide. The load for the oxen was 4,000kg. (4 tons), and for the cows 3,000kg. (3 tons) per couple, with the exception of the one lightest couple weighing 558kg., whose load was 2,200kg. The road was five kilometres (3 1-10th miles) in length

with a rise of 1:0.007 (1 in 143). Obstacles of sand were put in the road to make the test thorough; at every 500 metres two sandheaps would be met to pull through. The pair of animals which went over the road in the shortest time took 48 minutes, or 9.6 minutes per kilometre (one mile in 15½ minutes). The longest time taken was 66 minutes, or 13.2 minutes per kilometre (one mile in 23 minutes). The age of the animals was from 3½ to 8½ years; one of the cows was heavy in calf. I shall not give a specified table of the different performances of the couples in competition, as this would be of interest to former spec-

tators only. This report does not state which couples were in neck harness.

Show, 1897, Hamburg.

In 1897, at the Show in Hamburg, where only eight couples of oxen and six couples of cows were contesting, all oxen had forehead harness; some of the cows were in neck harness. For comparison, I shall give the table of the competing cows below. The road was level, but in bad order. There were four obstacles of sand, and the length four kilometres (2½ miles). In this instance the load drawn includes weight of wagon.

Time taken in Drawing 2,500 kg. (Two and a Half Tons) over Two and a Half Miles.

Kind of Harness.	Age.	Live Weight, kg.	Load, kg.	Time, Minutes.
Forehead ...	3 and 5	862	2,500	51.2
Forehead ...	8 and 10	988	2,500	43.0
Forehead ...	8 and 8	870	2,500	58.0
Averages ...	7 years	907	2,500	50.73
Neck ...	5 and 4	1,055	2,500	46.4
Neck ...	8 and 5	1,014	2,500	53.6
Neck ...	6 and 5	1,032	2,500	50.2
Averages ...	5½ years	1,034	2,500	50.06

Only the left cow was guided with reins, the driver walking; some of the oxen were driven from the wagon with double reins. Cows are, for reasons known, the draught cattle of the small farmer. Broken in when heifers, or not pregnant, quiet work in harness is not injurious to them even indeed when heavy in calf. Some of the competing cows were above seven and eight months in calf.

In all competitions the cattle have to be driven at a walking pace, therefore it may be interesting to know the shortest time over four kilometres.

DRAUGHT TESTS.

Shortest Time in Traversing Two and a Half Miles.

	Minutes.
At Dresden, bulls ...	46.2
" oxen ...	38.2
" cows ...	50.7
" oxen ...	35.7
At Hamburg, cows ...	43
" oxen ...	38.7
At Cannstatt, cows ...	45.9
" oxen ...	24.1
At Berlin, cows ...	31.3
" oxen ...	33.3
At Munich, cows ...	40

It was impossible to have the roads in these towns alike, and rainy or dry weather has an influence. But in Natal, where the shows are regular and held in the dry season, there should be the best opportunity to have competitions in harnessed oxen; prizes should be given for the animals and for the best driving; such competitions would go a long way towards the introduction of this kind of inspanning. The above figures speak for it; once adopted, it will not leave the country again.

If suitable for the *Agricultural Journal*, these lines may be used as a whole, in part, or modified.—I have, etc.,

J. H. LILIENTHAL.

Reinfield, Holstein,
23rd January, 1903.

Mr. Lilienthal's letter is of great interest, and contains records of what Natal is much in need of, namely, exact tests. And these tests were sufficiently astonishing. Would anyone who uses the South African yoke ever dream of a pair of oxen, weighing 9 cwt. each, pull-

ing a load of $2\frac{1}{2}$ tons, over a road containing sand heaps, at the rate of a mile in 20 minutes? Mr. Lilienthal's suggestion that competitions should be held at agricultural shows in Natal, and prizes offered for various modes of harnessing or yoking oxen, is one which may be commended to the agricultural societies. It is perhaps not too late to get up competitions of this kind the coming season.

The next letter is from Mr. A. Sinclair, of Dargle. Mr. Sinclair, by a long experience, has proved the superiority of the American or Australian form of yoke over that of South Africa. The sample he sent weighed little more than an ordinary Natal yoke. It had been in use for 23 years. It will be made use of as a model for the Experiment Farm tests.

MR. SINCLAIR'S LETTER.

A. N. Pearson, Esq., Director of Agriculture, Maritzburg.

Dear Sir,—I saw a reference in one of the agricultural journals about American yokes. I have, therefore, sent you an old one that was in use transport riding during the first Boer War, and continually used till quite recently. You will find it a perfect model if you want to make some.

I used wooden bows at that time, so the holes are 2 inches; I now use iron piping. $1\frac{1}{2}$ inch holes. Whitelaw & Co., Maritzburg, have models of them. The staples are made of $\frac{3}{4}$ inch iron, and should project underneath the yoke from 2 to 4 inches for high-pulling oxen. Buchanan, Howick, makes the staples. A good size to make the yoke from is a piece of bitter almond, black stinkwood, or hickory 5 feet long 6 inches by 6 inches.

When transport riding I always worked 12 oxen in the American yokes and 16 oxen in the Natal yokes to pull the same weight long distances, the same class of cattle, and they kept their condition equally well.—I am, etc.,

A. SINCLAIR, D.S.

Craigdarrock, Dargle,
14th January, 1903.

MR. TANNER'S LETTER.

Mr. T. M. Tanner, of High Veldt, Boston, forwarded a letter, together with a small model and a diagram of a yoke which he considers combines the best features of the South African and Australian yokes. The model shows it to be a straight yoke with skeys of the ordinary South African form, but between the skeys the yoke is hollowed out below and behind to fit the animal's neck, and to the top of the yoke above each of these hollows and between the skeys is attached a short straight strengthening piece.

Mr. Tanner states that this yoke was made by Messrs. Phipson Bros., of Deepdale, at a cost of 8s., that it weighed only about 1 lb. heavier than the ordinary yoke, and that he estimated it had an increased pulling power of one-third. He stated that the actual surface presented to the neck of the ox for pulling was quite three times that of the ordinary yoke. Yokes somewhat like this, but in which the Australian bow is being used instead of the skeys, are now being made by a Maritzburg firm.

MR. PETER MCKENZIE'S LETTER.

The following letter, written in a more critical vein, was received from Mr. Peter McKenzie, of Polela:—

Sir,—In your issue of 19th ult. appeared an article on the South African yoke, which I am rather surprised should have passed without comment.

I had always thought that the South African yoke was simplicity itself, but this article proves that it cannot be so simple as it looks, when an experienced man like Mr. Pearson can fall into such blunders in writing about it.

To begin with, he suggests, as a means of improving the yoke by 30 per cent., that the staple should be put in parallel with the "yoke skeys," instead of at right angles to them as at present.

Now, it is well known that an "after yoke" has the staples about half-way between the position suggested by Mr. Pearson and the ordinary position, and many a so-called "driver" (Native) has tried Mr. Pearson's experiment in this

modified form, by putting the after yoke on a pair of middle oxen.

The result is that the oxen are unable to pull at all, as the points of the "skeys" are forced into their shoulders when they attempt to do so, and I have frequently known both the experiment and its author condemned in most unmistakeable language.

Secondly, Mr. Pearson blames the yoke for causing "choking." Strictly speaking, I suppose it is the yoke that causes it, but as only a very small minority of oxen "choke" when inspanned in it, we Colonials always blame the ox and not the yoke. Mr. Pearson's description of how the choking occurs is, however, quite erroneous, as it is not caused by the wrong angle at which the staple is placed, but by the fact that the ox has not a properly developed hump. His neck is in the shape of a wedge, and the more he pulls the higher the yoke rises up the inclined plane to the top of his shoulder, and the tighter becomes the tension of the "strop" on his throat, and hence he chokes. An Africander ox, with his well-developed hump and clearly-defined neck, never chokes, and on such an ox the strop has little or nothing to do with keeping the yoke in position when he is pulling.

As regards the greater efficiency of the Australian yoke, I am unable to pronounce an opinion, not having used it; but I am sure that the number of oxen used in farming operations in Natal could be greatly decreased, and that without the substitution of any other yoke, by the providing of more efficient drivers than our Natives mostly are, and by using only picked oxen.—I am, etc.,

PETER MCKENZIE.

Seaforth, Polela,

21st January, 1903.

In reply to the above it must be said that Mr. McKenzie seems to have taken up a side issue and overlooked the main purport of the article of the 19th December, which was intended to direct attention to the necessity of some improved mode of yoking or harnessing oxen. Land and oxen and time in South Africa are fast becoming too valuable to allow of an inefficient method of utiliz-

ing ox power. Many practical South Africans have admitted that the yoke now in general use is inefficient. That it had advantages which made it specially suitable to the earlier conditions of the country can be readily admitted, but conditions are changing, and appliances must change accordingly.

As to Mr. McKenzie's special objections to points raised in the article under criticism, the correctness of his contentions cannot be admitted. The use of an "after yoke" as a "fore yoke" would not be a proper test of the modification of the yoke which was suggested in the article, for it is evident that if the position of the staple were altered, the form and size of the skeys would also need alteration. Mr. McKenzie states that the choking which occurs with the present yoke is not due to the form of yoke, but to the absence of humps on the oxen. In other words, he blames the oxen, not the yokes. But the oxen, such as they are, have to be used, and it is easier to adapt the yoke to the oxen than the oxen to the yoke. The article under criticism pointed out that the South African yoke was derived from India, where the cattle have humps. No doubt it is more suitable to beasts of that build, though even for them it is open to considerable improvement.

All the above letters are of value, and it is perhaps needless to state that suggestions and information on this or any other subject discussed in the *Journal* will be received and considered with pleasure.

For ticks on pigs, poultry, etc., louse, fleas, or other small vermin, probably the best insecticide is kerosine emulsion. Dissolve one pound common soap in a gallon of boiling water, and while boiling add it to two gallons of kerosine and churn violently until it emulsifies or thickens. For use dissolve one part of the emulsion in ten parts of warm water. Pigs and other animals can be sprayed with this, but small animals are most effectively treated by dipping them all but the eyes, mouth, etc. If fowls are dipped in this way twice a year, choosing a hot day and doing the work first thing in the morning, they will keep surprisingly free from vermin, where other reasonable precautions are adopted. Pure kerosine is sometimes used for poultry and other animals, but it is injurious to the skin, and often causes considerable irritation.

Veterinary Departmental Report for February, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of February, 1903 :—

Scab.—Ten fresh outbreaks of this disease have occurred during the month, two in Upper Tugela District, two in New Hanover Division, one in Krantz-kop Division, and five in Lion's River Division.

Lungsickness.—Eleven outbreaks have occurred during the month, four in Klip River Division, two in Dundee Division, and five in Zululand.

Rinderpest.—No actual cases of this disease existed in Natal at the end of the month. The area at Krantz-kop is still in quarantine. In Zululand the disease is as prevalent as ever, and is likely to continue so under the present laws. The Natives, in the great majority of cases, flatly refuse to inoculate, and although a considerable amount of moral pressure has been brought to bear on them by the Magistrates, they still refuse, and would do so even if inoculation was done free of charge. Satisfactory progress in the suppression of this disease will not be made until legislative power is given to us to enforce inoculation of in-contact cattle. At present we are wasting time and public money in Zululand, and hundreds of cattle are dying because we have not this legislative power. It is not a question of whether raw bile, glycerinated bile, or serum be used, as the Native owner refuses, in most cases, to inoculate at all. It is surely now recognised by those who have a practical knowledge of Rinderpest that this is not a difficult disease to suppress, provided ordinary measures are taken as regards inoculation, etc. Zululand has been for months past, and has all the appearance of remaining, a distinct source of danger to Natal. Infection has been brought into Natal on several occasions, and we have suppressed the disease. The Tugela River, between Zululand and Natal, is being well guarded to prevent cattle

crossing into Natal, and this expense must be maintained while the disease continues to be prevalent in Zululand. You will, therefore, see that, by reason of our not having the legislative power to compel inoculation of "in-contact" cattle, much expense is being incurred and discredit is being brought upon the Department.

Redwater.—Cases of this disease have occurred throughout the Colony during the month. D.V.S. Power states that three imported bulls have been affected in the Ixopo District, one dying. To endeavour to "salt" susceptible animals, as far as this disease is concerned, turns out in practice to be a fatal policy to adopt. If an animal once has an attack of Redwater his blood always contains the organism, and he may at any time (through the lessening of his vitality from any cause) have a second attack, which is not necessarily due to re-infection. In my experience, susceptible animals, which apparently recover from an attack of Redwater, in the great majority of cases are always suffering from the disease, and frequently die without warning.

Anthrax.—Twelve cases of this disease have occurred during the month, and one Native has died as the result of eating anthrax flesh.

Glanders.—This disease is still prevalent. 16 clinical cases have been destroyed during the month, and 12 which have reacted to Mallein. This does not include the horses which have been destroyed (at Estcourt and Weenen) belonging to the Natal Police.

Horsesickness.—Has been prevalent in the City and Durban during the month. In the Colony there have been altogether 90 cases reported.

I put up herewith reports of the District Veterinary Surgeons and Stock Inspectors.

S. B. WOOLLATT,
P.V. Surgeon.

13th March, 1903.

MOOI RIVER.—D.V.S. VERNEY.

Glanders.—This disease was reported to exist amongst the Police horses at Weenen, and, on examination, I found two clinical cases. I tested the remaining horses, but obtained no reaction to the Mallein either local or thermometric. The origin of this disease is somewhat doubtful, but, as an outbreak occurred in the same horses nine months previously, I am rather inclined to think the stable was responsible for the further outbreak. This stable has now been condemned as unsafe for horses. I also visited a horse, the property of Mr. O. Rottcher, Golden Valley. This horse was reported to have a chronic discharge from one nostril, and a hard enlargement under the jaw on the same side as the discharging nose; otherwise horse in good health and capable of doing a lot of work. Examination of the schneiderian membrane showed well marked ulceration, and the enlargement was the characteristic swelling of the submaxillary glands—a swelling about the size of an egg, hard in consistency, and, on palpation, it gave one the impression that it was part of the jaw bone. I tested the horse in the same stable, and this horse showed well marked reaction both local and thermometric. *Post-mortem* examination revealed a well marked case of Glanders. A number of horses in Umvoti County had been in contact with the clinical affected horse, and I have communicated with Mr. Cordy about this. He is going to inoculate all horses that have had any contact with the horse or been in the same stable. This should effectually stamp out this outbreak.

Dunsickness still continues to be more prevalent than usual, and the want of rain, I think, is probably responsible for this. I have only had one case recover of this disease.

I had a bad case of parturition in a cow, which necessitated the removal of both fore legs of the calf before delivery took place. The cow made a good recovery.

ESHOWE.—D.V.S. TYLER.

Rinderpest.—Very little change has taken place since my last report as re-

gards the prevalence of this disease in Zululand, and I am afraid that there will be no material reduction in the number of cases until compulsory inoculation is enforced. In every district the same difficulty is met with, more or less, and in most, the great majority of the Natives flatly refuse to inoculate at all. The various Magistrates have used their influence as far as they could, in many cases with good effect, but nothing short of compulsion will ever give good results in practice.

In Eshowe District the disease does not exist to a large extent in any one place, but there are several situations where two or three kraals are infected. One such place is in Mtonga's Ward, close to the mouth of the Hlangwini River, and on the bank of the Tugela. This outbreak is a standing danger to Natal, especially so as the river keeps unusually low, and, although a guard is maintained along the bank, and the Natives have been warned against carrying meat, etc., I quite expect that the disease will appear on the opposite side. In this particular place the Natives have refused to inoculate with either bile or serum, although the use of the latter in infected troops has been offered free of charge. There have been five fresh outbreaks in the north of the Umhlabazi District, and here again the Natives refuse to inoculate. In Lower Umfolozi District there have been six fresh outbreaks during the month near Empangeni, and one at Bonambe. There are two Native inoculators and one European employed in this district, and so far they have done good work. The disease is also slowly spreading in the Ndwandwe District, and, so far as one can see, it will continue to do so until we have the afore-mentioned power to enforce inoculation. There are three distinct outbreaks in the Nkandhla District, but they are at some distance from each other. I regret that we have now got an outbreak in the Hlabisa District, taken there, as usual, by a span of oxen which had come from Nongoma. The cattle are being strictly isolated, and I hope to prevent any extension from this case. Five fresh outbreaks occurred at

Mahlabatini during February, and there were 14 deaths. In this district the Natives are inoculating with greater alacrity than in any other, due in great measure to the efforts of the R.M., and Inoculator Chapman has therefore been able to inoculate considerably over a thousand head of cattle during the month. If this is maintained, I have no doubt the disease will soon be under control. A few scattered outbreaks exist in the Melmoth District.

Lungsickness.—During February one fresh outbreak occurred at Mahlabatini, and two licenses have been renewed. In Eshowe District one license renewed; Melmoth, one fresh outbreak; Nkandhla, two fresh outbreaks. In Ndwandwe there have been three fresh outbreaks, and in the Nqutu District six.

Scab.—One herd of goats is infected with the disease in the Nqutu District.

Glanders.—One animal has been condemned and destroyed at Ginginhlovu by me since my last report.

Horsesickness.—Only one death has occurred from this disease to my knowledge, and there seems to be very little about this year.

IXOPO.—D.V.S. POWER.

Scab.—I am glad to say that the Ixopo and Polela Divisions are now free from Scab, and it is hoped that flock-owners whose sheep have had the disease during the summer months will take the precaution of again dipping in the autumn or beginning of winter, as, although declared clean just now, it should be borne in mind that the Scab parasite, being capable of existing for such a long time apart from the animal body, is in most cases still lying about in stony places or kraal walls, posts, etc., and therefore capable of again producing the disease. Further outbreaks can only be prevented by dipping and moving the flock on to clean pasture.

Glanders.—I examined an old Military horse belonging to Mr. John Carter, Snow Hill, Polela, and found him showing clinical symptoms of this disease; also, a kafr pony that had been running with this horse. I had both destroyed, and tested the in-contact horses with

Mallein. One gave a decided reaction, and the *post-mortem* confirmed the diagnosis. Two of Mr. Carter's horses contracted Glanders from this Military "reject" while running together on the veld.

Specific Ophthalmia.—During the month I have met with some cases of this disease, and treated them with a solution of Zinc Sulph. and Ir Opii with good results.

Redwater.—A good many cases of this disease occurred during the month, but not so many as during December and January. I treated three imported bulls. One died and two recovered. The one that died was a Polled Angus belonging to Messrs. Archibald & Co., Highflats, and this was his second attack. He had been in the Colony about nine months. The young bull belonging to Mr. Thos. Foster, of Stainton, to which I have referred in a few of my monthly reports as having had so many attacks of Redwater, has had its last, and died on the veld without being even noticed ill. He had been doing extremely well for the past few months. I made the *post-mortem*, and have never seen a more virulent case of Redwater. The reason I mention this case here is that this animal had the disease so many times that one would think he now had sufficient immunity to withstand an attack on the veld. I have seen a good number of imported cattle recover from a severe form of this disease, and then at varying periods afterwards contract an acute attack and die pretty suddenly—twenty-four or thirty-six hours after first showing symptoms. I have also seen this occur when the animals had recovered from more than one attack.

At present it is difficult to imagine that preventive inoculation would confer sufficient immunity when we see cattle die of the disease that had previously suffered from one or more naturally contracted attacks.

Horsesickness.—Nil.

GREYTOWN.—D.V.S. CORDY.

Scab.—Three fresh outbreaks. Two of these are among sheep belonging to Natives in Swaimana's Location. Owners of flocks which have recently been under

license, especially those in which the outbreak was a bad one, would do well to dip again before the winter sets in, and thereby lessen the risk of a further outbreak during the cold weather.

Lungsickness.—The district is once more free from this disease.

Glanders.—This disease is continually cropping up. On D.V.S. Verney informing me that he had had occasion to destroy two horses in the Golden Valley, Mudén, and that horses in the Mudén District, on this side of the Mooi River, had been in contact with them, I visited the district and tested with Mallein fourteen animals in all. Two of these gave typical reactions and were destroyed. In both cases the *post-mortem* examination substantiated the diagnosis. Four other horses were tested during the month in other parts of Umvoti County, one of which gave an unsatisfactory reaction, and has been isolated until re-tested at a future date.

Rinderpest.—During the month seven fresh kraals have become infected, the disease once more appearing outside the quarantine area, at a point north of the Hot Springs, Tugela. This, of course, has caused a further extension of the quarantine boundary. About twenty head of cattle died during the month, but at the end of this period things were in a very satisfactory state, not a single case of the disease existing. As cattle are dying daily on the Zululand side of the river, and the disease there, according to Native reports, is very rife, I cannot but look upon this as a great source of danger, and I should be glad if the inoculation in this locality could be accelerated as much as possible. Special precautions are being taken that cattle do not cross the river, and that meat is not brought across by the Natives.

Horsesickness.—There has been very little of this disease, only about half-a-dozen cases being reported during the month.

Mange in Horses has decreased to a very considerable extent, there being very little in the district at present.

HOWICK.—D.V.S. WEBB.

Lungsickness.—There are no cattle under license in this district.

Scab.—Only four herds are under license in the Lion's River Division, and none at all in the Impendhle.

Horsesickness.—I have heard of some half-dozen horses which have died from Horsesickness, but only one case was brought to my notice.

Anthrax.—Stock Inspector Hodson reports that Mr. A. Armstrong has lost 12 head of cattle from this disease, and I believe that a Native on an adjoining farm who ate some of the diseased meat died as a result.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Two fresh cases have broken out during the month, viz., one in Dundee Division and one in Newcastle Division.

Scab.—No cases reported.

Glanders.—I destroyed a horse belonging to W. Wareing, Dundee, on the 16th inst. The animal was suffering from both Glanders and Farcy, and had only been in the owner's possession ten days. I was unable to trace the history of this case, as the man who sold the horse had left the town. Fortunately there were no other horses on the premises.

Horsesickness has been very quiet, also Gallsickness, Redwater, and all other diseases that are usually prevalent at this time of the year.

Mr. Wingfield Stratford left Newcastle on the 27th inst. to take up his duties as Stock Inspector in the Utrecht District.

DURBAN.—D.V.S. AMOS.

The importations of stock have been as follows:—

Oxen	5,593
Sheep	3,518
Mules	1,654
Donkeys	1,557
Heifers	477
Horses	341
Goats	45
Dogs	27
Bulls	12
Cows	6
Calves	4

Total 13,244

Of the oxen, 4,844 came from Madagascar, and the remaining 749 came from Argentina, and were for slaughter purposes. Of the sheep, 3,407 came from Argentina, and were slaughter wethers; 98 rams came from Australia, 8 rams from Hamburg, and 5 from New Zealand. All the mules and donkeys came from Argentina. 474 heifers came from Argentina, and 3 from New Zealand, which was the first consignment from there we have had, and they were of a very good quality. The six cows came from the Argentine. 154 heifers were subjected to the Tuberculin test, and three reacted (two heifers and one cow), the remaining heifers landed with Tuberculin certificates. *Post-mortem* examination proved the existence of Tuberculosis in every reacted case. It is worthy of note that these are the first animals that have reacted to Tuberculin from the Argentine. Of the horses, 284 came from Australia, and were S.A.C. remounts, 52 came from America, and 5 from England. The 45 goats came from Cape Colony. Of the bulls, 8 were American, and 4 from New Zealand. The whole lot were tested, and out of the former eight one reacted and was destroyed. *Post-mortem* examination proved the existence of Tuberculosis.

Horsesickness during the month has gradually been on the increase, and in the last week 35 cases were reported, and approximately the deaths during the month have been from 40 to 50 in total. All phases of the disease have been noticed, and only in rare instances is recovery noted.

Lungsickness.—Nil.

Glanders seems to be on the decrease, I am glad to say, although I have had another heavy death roll this month, inasmuch as I have destroyed 11 clinical cases and 9 reacted animals, making a total of 20. *Post-mortem* in each instance revealed lesions of Glanders. I am in hopes of seeing an improvement in this disease, and, as many stables will be tested for the second time this month, several stables should be declared free, and owners are now taking every precaution, as they have found it is to their cost to have Glandered horses in their stable.

Tuberculosis.—Many animals have been tested and four reacted. These were de-

stroyed, and *post-mortem* examination confirmed the reaction in each case.

During the month a necrotic disease of horses' coronets and pastures has been very prevalent in the stables on the Eastern Vlei. I have reported frequently the existence of this disease, and it has ruined many animals as it is a very rapid disease and extremely painful, involving the deep structures and often the joint itself, so that destruction has to be carried out, and the disease is by no means amenable to treatment. I went with Mr. Pitchford and showed him a case of this disease, and tubes were inoculated from the limb affected, but I have received no information on the matter up to now. In the near future I hope to make microscopical examinations of sections of the necrotic tissue with a view to throwing some light on the matter.

Another disease I have noticed is Malarial Fever in dogs, which often proves fatal. I have in some instances demonstrated organisms in the red blood corpuscles, but I have to make further investigations before I can report anything definite.

Mange is still noticeable, but is not nearly so bad as formerly.

During the month I prohibited from landing one shipment of cattle from Mom-basa that was undoubtedly affected with disease (probably Rhodesian Redwater); also, a shipment of Australian heifers that could not land under the existing proclamation, and also one lot of sheep that was badly affected with Scab.

VERULAM.—D.V.S. SHARPE.

Scab.—None.

Glanders.—This disease I find is very widespread. During the month I have tested 15 animals belonging to seven different people. Of these five reacted and were destroyed. I have also destroyed two mules showing clinical symptoms.

Rinderpest.—None.

Horsesickness.—Stock Inspectors Swales and Robbins report a lot of cases of Horsesickness, and it seems to be rather bad round here, but in the other parts of the district very few deaths have occurred. I believe if horse-owners were to use the thermometer more regularly it

would be the means of saving many horses, enabling one to begin treatment in the very earliest stages of the disease.

General.—Stock on the whole are very healthy.

LADYSMITH.—D.V.S. O'NEIL.

Rinderpest.—This month was noted for the unexpected outbreak of Rinderpest on the town side of Umbulwana, which I discovered by making a *post-mortem* examination on a cow that was reported to have died suddenly, the cause being attributed to choking by medicine administered as a drench lodging in the windpipe, whereas the case on examination proved to be a typical one of Rinderpest, but having no lesion in the mouth. There were three other sick animals among the same troop, all young, but the fact of the herd having been previously inoculated before coming into this District undoubtedly accounts for the mildness of the outbreak. By prompt action and inoculation I am pleased to say that the rest of the troop remained healthy, and the sick ones salted.

Lungsickness.—No fresh cases.

Glanders.—None.

Horsesickness.—Three cases at Tugela.

Mange.—Four cases this month, which were brought into town to be sold by auction. I, however, immediately dealt with these.

Gallsickness and Redwater.—The number of cattle which succumbed to this disease during the month amounted to 21 head throughout the District. The dry and unhealthy weather we are experiencing must to a great extent predispose the young stock to this disease.

MARITZBURG.—D.V.S. FYRTH.

Scab.—No cases.

Lungsickness.—No cases.

Glanders.—I have met with no cases of this disease during the month. One horse was tested with Mallein but did not react.

Mange.—A few slight cases and one very bad one have been brought to my notice. The slight cases were cured, and the bad case, which was the worst I have

seen in South Africa, was shot by me, as no owner could be found for the horse, which was found wandering on the road.

Horsesickness.—This disease has been very rampant, especially in the City Division. In the City Division during the month 22 deaths from Horsesickness have been reported to me. Two deaths in Umgeni, and five deaths in the Upper Umkomanzi Division have been brought to my notice, although, without doubt, a large number of deaths have occurred which have not come to my notice.

General.—There have been no cases of Anthrax or of Quarter-evil brought to my notice this month.

VRYHEID.—D.V.S. CROLE.

Rinderpest has been on the increase this month, but is confined to one area, viz., the Pongola Valley. As a considerable amount of cattle in that district have now been biled or salted, the epidemic should not spread to any great extent.

Lungsickness.—Several fresh cases have been reported during the month, but none could be found on examination.

Horsesickness.—The mortality this season has been remarkably light. The expected influx of crowds of prospectors and their horses to notoriously unhealthy districts will, however, be sure to be followed by a greater mortality.

Glanders has occurred in a few instances at Vryheid.

Paralysis of the Hind Quarters in cattle has been brought to my notice now and then. I have not been able to determine its oetiology yet, but some sort of vegetable poisoning analogous to ergotism suggests itself as a factor.

Equine Mange has very largely decreased.

No case of Redwater has been brought under my notice during the month.

The 1902 corn crop of the United States shows a large rate of yield of inferior quality, and will furnish little if any more than a fair, normal supply of commercial corn. The whole crop is estimated at 2,556,311,000 bushels from 94,488,000 acres, or an average of 27.1 bushels per acre. The State of Illinois shows the large rate of yield with 880 bushels, and South Dakota the smallest with 13.0 bushels of those States enumerated.

Cattle Dipping.

By GEORGE D. ALEXANDER.

WITH reference to certain enquiries by the Editor, Mr. George D. Alexander has been good enough to write the following:—

I believe that Cooper's Dip would, if used in the proper proportions, destroy ticks, but I do not think that the cattle dipped would remain free from ticks for anything like the time that cattle dipped with the formula I gave you, and which appears in No. 8 of your Journal, 1902.

I think also that it would be more difficult to use a dip such as Cooper's, which mixes mechanically, than the chemical solution used here (Nel's Rust). You state that the objection to the use of the dip used here is the necessity of cooking this, especially in case of those who have to drag timber a long distance. If the heating tanks are built, as described to you, with a flue extending half way up the tank, the amount of firing required is very small. And once the full quantity of dip required to fill the tank has been cooked, the replenishing of such dip as is removed by the cattle is not a serious matter, especially when it is taken into consideration that with the closed in fireplace all sorts of rubbish can be used as firing material, and there are few places where such a means of getting rid of rubbish would not be of an advantage, instead of a drawback.

Say the tank holds 3,200 gallons of dip, and that each beast takes away, approximately, one gallon of dip; if 800 head are passed through the dip it will

only be necessary to replace 800 gallons of the dipping fluid, which will be one boiling of the two 400-gallon tanks. And the fire required for this need not, I think, prove any serious drawback, even in such places where wood is scarce.

Again, I think it is important that cattle should not be plunged into a cold bath, and that there is very much less danger in immersing cattle in a warm bath, especially when they have been driven, or are very hot.

It has been suggested that caustic soda and tallow might be used instead of soap, and the quantity of tar decreased. I cannot see any advantage in this. Soap, I think, would be more easily obtained, at no greater cost than the tallow and caustic soda, while to lessen the tar would, I think, be a mistake, as it is the tar that is the great factor, in my opinion, in preventing the cattle from coming reinfested with ticks.

The experience here in dipping cattle has demonstrated that it is advisable to avoid, if possible, dipping on extremely hot days, as the effect seems to be much more severe on the cattle, and the hot sun seems to have a burning effect on the hides while still wet with the dip. If it is necessary to dip on a certain date, irrespective of conditions of weather, the dipping should either take place early in the morning or late in the afternoon, or, if this is not feasible, the cattle should be driven to a shady place, out of the fierce rays of the sun, until they are quite dry.

Lime in the Creameries.

IN a recent lecture, Dairy Instructor B. Boggild, of Denmark, gave a practical hint to the Danish veterinarians which might well be taken to heart by the various milk commissioners and Boards of Health when they propose to instruct the practical milk producers.

He said that there is often occasion to emphasize that it may be necessary to distinguish between cleaning and disinfecting. It must be conceded that the cleanliness with which we—for practical reasons—must be satisfied in our creameries and stables in no way satisfies the

strict demand of the hygienism which must be applied in fighting contagious diseases in a herd; but on the other side it is generally acknowledged that the best possible cleanliness is equally desirable on account of the health of the cows and development of their disease-resisting powers, as it is of the great importance in securing of fine and uniform dairy products.

He then goes on to show how conditions in the creameries and stables have changed, and how bacteriology, while it has helped us to a clearer understanding of many conditions, has also given us various difficulties when we wanted to carry out the bacteriological theories in the practical dairy work, notably as to cleaning. The desire has been for the best—which was impossible to obtain—and the second best, which could be obtained, has often been despised.

Ten or twenty years ago heat was used in the fight against bacteria. Steam was employed liberally, and the result was the warping of churns and cream-barrels. The floors were scrubbed with boiling water, and it even was proposed to scald the drains, which increased instead of decreasing the smell.

At present it is an exception when a churn is steamed. All wooden utensils are rinsed and scrubbed with cold or luke-warm water to remove the milk, and then they are covered with a coat of thick mush of slacked lime. After ten or twenty minutes, or later, the churns (or other utensils) are scrubbed with the lime and cold water, after which they are rinsed twice in warm water hot enough to make the wood dry quickly.

Lime is used for cleaning in nearly all Danish creameries, not only for woodenware, but also for tinware and for scrubbing the floors. It took some time to introduce it, as the butter-makers, to begin with, had their hands affected by the lime, but when they once learned to use it they had no trouble, and the use of steam as well as of soda has been reduced.

Lime is now also used more and more in place of oil-paint, which is often

ruined by the dampness or heat in the creameries. Porcelain tiles are, as a rule, too expensive, whereas lime is cheap and easily applied.

It is often objected that the lime will peel off, but the lecturer did not deem that a drawback in the creameries or stables, because it was so much easier to clean. To wash a painted wall is in no way easier than to brush off a white-washed one with a stiff brush and give it a new coat, which is certainly cheaper to start with.

Possibly bacteriologists might object to the recommendation of lime because it does not kill the bacteria like steam, but the lecturer met this by claiming that in practical work the steam is often cooled too quickly, so that it produces dampness instead of a high temperature. Nor must it be overlooked that the lime is used in combination with drying by the aid of fresh air and draught through the rooms.

The drying, which used to be laid stress on in the old Holstein dairies, has sometimes been neglected in the steam separator creameries, and he illustrated this by mentioning the case of a cheese cloth. Be it washed and boiled ever so carefully, if left wet it will smell and soon rot; but if it is hung up to dry every day, it will remain fresh and smell all right.

In view of these facts the lecturer suggested the necessity of suitable ventilation of creameries, good floors, proper drainage, and more light. Summarizing, he says:—

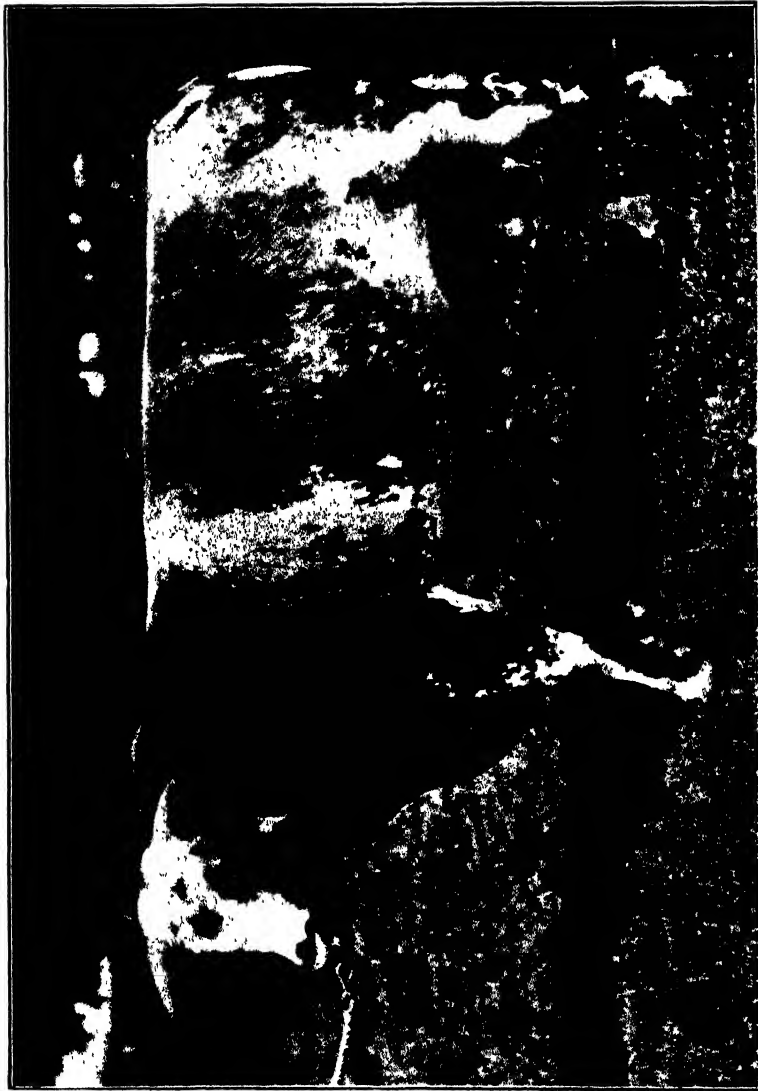
Let light and fresh air have full access.

Use lime all the time.

Keep the floors as dry as possible.

At Crestow, in Bucks, is what is thought to be the largest enclosed feeding ground in the kingdom. This "Great Ground" contains over 350 acres, and the late Mr. J. K. Fowler, in one of his interesting books of reminiscences, remarks, "As a proof of the remarkable fertility of this pasture, I have myself seen upwards of 250 head of full-sized cattle, with 500 ewes and lambs, and twenty mares and foals, grazing together."

SHORTHORN BULL.



FIRST PRIZE AND CHAMPION ROYAL SHOW, ENGLAND, 1902.
EXHIBITED BY HIS MAJESTY KING EDWARD VII.

Dehorning Dairy Cattle.

EFFECT ON YIELD OF MILK AND BUTTER FAT.

PROFESSOR DOANE, of the Maryland Agricultural Experiment Station, U.S.A., writes :—

The first dehorning in this country on a large scale of which there is any record was done by an Illinois farmer, who was engaged in the production of beef cattle. Previous to this there had been sufficient experience in the necessary surgical work of veterinarians to know that the horns would be removed from a mature animal without any particular danger to its life. At different places in Europe dehorning had been practised for a number of years, and it is very likely that it was the reports from these places that first led to the practise in this country. It was not long after the first dehorning in Illinois that its advantages were realised, and the practise spread rapidly. The beef herds were the first dehorned, and then the dairy herds, as it was seen that, at times, horns were a disadvantage among milking stock. The idea spread east and west, to some extent, and now, in any part of the country, herds of dehorned cattle are a familiar sight; while in the middle west, among the large beef-raisers and even among the dairymen, the great majority of the herds are dehorned. Especially is this true among the working herds of cattle. In show herds the consideration of natural appearance of the animal retain the horns.

At a number of the experiment stations exact records of the dairy milk yield before and after dehorning have been kept. In a few instances the per cent. of butterfat has also been noted at each milking for a few days before and after dehorning, and from these we can make a pretty fair estimate of the effect of dehorning on the dairy cow.

At the Wisconsin experiment station, a record of ten cows was kept for the four milkings before dehorning and four milkings immediately following dehorning. The ten gave 289.3 lbs. in the four milkings before, and 243.6 lbs. in the

four milkings after dehorning—a loss of 45.7 pounds, or 16 per cent. Each cow was tested two milkings before dehorning; but four milkings after dehorning. In every case but one the milk tested much lower the milking immediately after dehorning than it had tested the two milkings before dehorning. But the test gradually increased, until it was much higher than it had been in the milkings previous to dehorning, and the actual amount of butterfat produced by the cows was as much or more than it would have been had the cows not been dehorned. At another time at the same station, twelve cows were dehorned, with a loss of 5 per cent. in the total yield of milk in six days after dehorning, and a gain of 4 per cent. in the total amount of fat produced in the same time. A record of the weights of the cows before and after showed practically no loss due to the operation.

At the Minnesota station nine cows produced 7 per cent. less milk in three milkings following dehorning than they had given in the three previous milkings, and produced 8 per cent. less total butterfat in the same period. Six cows which had been kept where they could see the excitement and smell the blood, lost 3 per cent. in their milk yield, and 1 per cent. in their total butterfat in the same time, showing that the slight loss of the dehorned cows was due partially to excitement. A weak feature in this record was that three milkings were selected, making two nights' and one morning's milking in one period, and two mornings' and one night's milking in the other period. Cows seldom give the same at morning and night, and the test nearly always varies at these two milkings.

At the Georgia station nine cows made an actual gain in milk yield the day following dehorning.

At the Tennessee station, nineteen cows were dehorned, and in ten days they lost only 34.2 pounds of milk from

a total previous ten days' yield of 2784.3 pounds.

The New York station, at Cornell, found that five cows lost an average of one pound a day for four days following dehorning. Seven cows not dehorned lost an average of one half-pound a day in the same time. One of the dehorned cows lost an average of four pounds per day in the record time.

At the North Dakota station fourteen cows were dehorned. Most of them fell off in their milk slightly, but gained in per cent. of butterfat, and at the fourth milking all were back to their normal flow. The fourteen cows made about one pound less in the two days following dehorning than they had made in the two previous days.

From these reports it appears that there is a very small per cent. of loss in

the total amount of milk produced, and very little, if any, loss in the total fat produced in the first few milkings following dehorning. In the majority of recorded trials the cows came back to their natural flow of milk in less than a week, often in two days. Judging from this, there is no amount of pain suffered by the cow, and practically no loss in product resulting from the operation. It must be emphasised that as far as our knowledge of the dairy cow goes at the present day, we would be practically sure that any protracted pain, or any great physical shock, would lead to a material reduction in the amount of milk produced. It seems that the excitement of the cows caused by handling them in a manner to which they are not accustomed, is almost as operative in reducing the milk flow as the dehorning itself.

Cattlemen and Sheepmen in the U.S.A.

THE war between cattlemen and sheepmen which has been waging for several years past in the West, especially in Colorado and Wyoming, seems to be taking a new lease of life from the present outlook. It is said that fully 10,000 sheep have been killed by cowboys during the past three months. During the past ten years quite a number of shepherds have been killed and many more wounded; besides this over 60,000 sheep have been sacrificed. Then thousands of dollars' worth of camping outfits, haystacks, ranch buildings, etc., have been burned. One sheepowner in Wyoming alone lost 5,000 head of sheep. These were killed by a band of 150 masked men. In most cases the sheep are killed by being driven over precipices. It appears that sheepmen are not alone in their troubles, for only a few days ago 600 head of Angora goats, valued at 8,000 dollars, were killed by cattlemen, together with 300 head of sheep belonging to the same parties. What is described as "a war on goats" is being waged against this valuable

animal in the West. Viewed from a cattleman's point of view, there is no doubt some reason for this antipathy shown by the cattlemen against the shepherds and goatherds, for it is an undeniable fact that cattle find but poor fare in the wake of either sheep or goats. The goat is considered to be a greater damage worker on the range than sheep, for while sheep ruin the range for cattle-ranching, goats do more than this, for they not only damage the herbage, but every seedling tree is destroyed by them.

There is every reason to think that the range problem will soon be settled with other weapons than the rifle and revolver. Individual ownership will be the weapon. Just as long as the range is free and open to all comers, just that long will bloody battles be the order of the day for the reason that both cattlemen and sheepmen think they, and they alone, should have the "right of the range." There was a time when both parties kept out of each other's way, but as the area of the range seemingly grew smaller, the jealousies of the sheepmen

and cattlemen grew apace. There is an actual hatred existing between them to-day. Scarcely a day passes but what we hear of battles of more or less severity going on between these two parties or factions. The cattlemen claim that it is not only good for themselves that the sheepmen are being fought, but for the good of the country. Under existing conditions laws are practically useless and prosecutions impossible. The sheepmen are in most cases wealthy, and are

at present buying up large tracts of land suitable for range purposes, making an especially strong effort to get hold of the best-watered sections. Their methods are being followed by the cattlemen and horsemen also. It will be but a matter of a very short time before all these lands will become private property, then will the bloody feuds between cattlemen and sheepmen become a matter of history.—*Pastoralists' Review*.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of February, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive			Coal raised. tons. cwt.	
	Above Ground.			Below Ground.			Work.				
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Dundee Coal...	16	165	13	13	118	324	1	9	34	10,146	16
Elands Laagte	12	18	155	13	129	275	...	...	...	9,246	7
Natal Navigation	22	47	152	16	283	90	11	23	...	9,115	13
St. George's ...	12	72	70	6	147	85	...	...	...	5,540	
Glencoe ...	12	66	78	10	200	7	3	26	...	3,910	0
Natal Marine	6	67	8	7	165	4	...	...	...	3,320	14
No. 42	6	19	13	2	101	...	...	...	...	1,332	4
E. and W. Lennoxton	2	5	11	2	21	29	...	...	...	1,229	16
Natal Merthyr	*7	99	16	0	54	1	...	...	...	1,171	1
Newcastle ...	4	11	11	5	80	2	...	...	...	1,167	0
Natal Steam	1	8	7	2	100	...	...	...	...	940	2
Ramsay ..	6	14	21	3	53	32	...	...	...	875	15
Crown ...	2	15	23	2	42	19	...	...	...	655	0
Central ...	3	45	2	1	100	1	3	31	1	552	7
Natal Victoria Navigation	2	20	4	2	15	7	3	35	2	453	3
South African	7	44	6	4	58	4	...	...	...	384	0
Durban ...	...	...	...	...	...	...	42	264	37	...	...
Cambrian ...	...	...	...	...	...	...	22	82	39	...	...
Total ...	120	715	590	88	1,696	871	85	470	113	50,039	18
Corresponding month, '02	100	459	502	75	1,444	900	10	31	105	48,502	0

* Total employed—not separated according to employment above and below ground in Colliery return

CHAS. J. GRAY, Commissioner of Mines.

March 10th, 1903.

Return of Coal bunkered and exported at the Port of Durban for the month of February, 1903 :—

	tons. cwt.
*Bunker Coal ...	17,496 16
Exported to :—	
Cape Colony ...	...
Beira ...	...
Delagoa Bay ...	20 0
Total ...	17,516 16

* Included in this is imported coal, viz., 418 tons.

Custom House, Port Natal,
March 2nd, 1903.

(Signed) W. L. HOWE,
pro. Collector of Customs.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab "	N. Grant ... P. G. Boshoff ...	Brakfontein. Smaldeal.
J. Button ..	Estcourt, South of Bushman's River	Lungsickness "	J. B. Brewitt ... R. E. Wright	Wagon Drift. The Alps.
J. J. Hodson ...	Lion's River ...	Scab " " " "	J. Kirg ... C. Strapp ... J. & E. Parker ... E. Parkinson ... H. W. Wardale ... G. & B. Hutchinson	Lynedoch. Oatlands. Tetworth. Klipfontein. Beverley. Boschfontein.
K. Soutar ...	Portion of Lion's River	"	F. Stanley ...	Nonpariel.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
A. H. Ball ...	Weenen ...	Scab " "	J. Crathorne ... J. P. Lotter ... T. Hair ... H. J. Vandermerwe	Beaconsfield. Berg Vleit. Gretna Green. Exchange.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
E. J. B. Hosking ...	Upper Umkomanzi	"	W. W. Johnson ...	Cottingham.
A. S. Parkinson ...	New Hanover ...	" "	Makenke & others { Bongola & others }	Swazimana's Location.
C. J. Van Rooyen	Krantzkop ...	" " "	H. T. Van Rooyen Mrs. Nel ... J. P. Nel ...	Krantzkop. Ungegunt. Sweet Home.
R. Wingfield-Stratford	Utrecht ...	Lungsickness	P. Jordaan ...	Tusschembi.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area, on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 28 herds of cattle under license for Lungsickness, and 12 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	4 for Lungsickness, — for Scab
Klip River	"	...	...	6 " 5 "
Dundee	"	...	...	1 " 6 "
Umsinga	"	...	...	3 " 2 "
Upper Tugela (North of Tugela River) Division	...	...	...	— " 2 "
Zululand—Ehohwe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	...	2 " — "
Nkandhla and Ngutu Districts...	...	...	...	5 " — "
North of White Umfolosi and Umfolosi Rivers	...	...	...	7 " — "
Total	...	...	...	28 12

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Town Lands, Ladysmith.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolozi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District.

Krantakop Division :—Amobonvu Location.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 19th March, 1903.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of February, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Feb. 2	Seed Potatoes	550 boxes	Liverpool	Clan Graham	Free of Pest.
" 3	Table	200 "	"	"	" "
" 7	Oranges and Lemons ...	80 cases	Naples	Kron Prinz	" "
" "	Apples	258 "	Albany	Commonwealth	" "
" "	Onions	80 "	"	"	" "
" 9	Seed Potatoes	230 "	Southampton	Guelph	" "
" "	Oranges	335 "	Naples	Herzog	" "
" "	Seed Potatoes	4 bags	"	"	" "
" "	Apples	4 cases	"	"	" "
" "	Pears	2 "	"	"	" "
" 12	Lime Plants, Palms, etc.	3 "	London	Inkonka	" "
" "	Table Potatoes	425 crates	"	"	" "
" "	Ornamental Plants ...	6 cases	"	"	" "
" "	Seed Potatoes	785 "	"	"	" "
" 17	Apples	262 "	Sydney	Salamis	" "
" "	Lemons	110 "	"	"	" "
" "	Oranges	70 bags	"	"	" "
" "	Lemons	38 cases	Trieste	Galiccia	Badly affected with Scale, burnt at Point Destructor.
" 20	Apples	33 "	Melbourne	Gracchus	
" 25	"	10 "	Southampton	Walmer Castle	Free of Pest
" "	"	60 baskets	Capetown	"	" "

C. B. JONES, Examining Officer.

Custom House, Durban, 4th March, 1903.

Lungsickness.

By D. HUTCHEON, C.V.S., Cape Colony.

THE Chief Veterinary Surgeon (Mr. D. Hutcheon, of the Cape Colony) in his last Annual Report says:—Lungsickness, or the contagious pleuro-pneumonia of cattle, has been spread over a large area of the Colony owing to the compulsory movement of cattle during the war, but with the cessation of hostilities, and the inauguration of a united policy by the Governments of the South African Colonies in dealing with this infectious disease of cattle, we should be able to get rid of it effectually.

What is the best practicable method of eradicating lungsickness in our South African herds? There can be little doubt that absolutely the quickest and

surest method would be to slaughter not alone the actually affected animals, but also all cattle that had been in contact with them. This was the method adopted in England, the United States, and in every country in Europe where the disease has been entirely stamped out. But the disease has now become so widely prevalent amongst the cattle in our Native territories, and there are so many other strong reasons why such a measure could not be successfully carried out in this country, that it need not be further discussed.

The only alternative measure that offers any reasonable prospect of success is the immediate and strict quarantine

of all infected herds, and the prompt isolation of all infected animals in the herd, until the inspecting officer arrives, when the latter should all be slaughtered, and a certificate to that effect given to the owner, in which should be stated also the estimated value of the animals for compensation purposes. The rest of the herd should then be immediately either inoculated or drenched, as there is no longer any doubt as to the efficacy of either process as a preventive of the contagious pleuro-pneumonia of cattle, if the operation is properly done.

I am well aware that many careful and observant cattle farmers have been successful in arresting the spread of lung-sickness in their herds by the prompt slaughter of all the affected animals, without resorting to either inoculation or drenching, but unless the inroad of the disease is recognised at an early stage, the loss entailed in carrying out this method is sometimes very heavy, so that owners often hesitate when valuable animals become affected. For this reason I am strongly in favour of inoculation being resorted to as soon as possible after the disease has been detected in the herd.

The main object aimed at, however, is the compulsory slaughter of every affected animal. Science and experience show that the contagious lung-sickness of cattle is communicated from a living affected animal to a healthy one mainly by the breath, and in the open air by that medium only. It is further proved that animals which recover from the disease remain a source of infection for an indefinite time after their apparent recovery. I do not mean to infer that every animal which recovers from an attack of contagious lung-sickness will remain such a source of infection for months, or even years, but it is a well-known fact that many do, and it should be carefully noted that it is the mildest cases which are the most dangerous.

The extent of lung tissue involved by the lesions of pleuro-pneumonia, in fatal cases, is very variable; the whole of one lung, or the greater portion of both may be affected. In the latter cases the only limit to the extension of the disease would appear to be the amount of healthy lung tissue necessary for the con-

tinuance of life. In the large majority of those cases which recover, however, the disease is confined to one lung, and if the whole of this lung becomes involved—which it does frequently—the consolidated lobules rarely regain their normal condition after the absorption of the exudate; the general tendency is to degeneration, and death of the lung tissue along with the exudate, and the gradual absorption of these degenerated products by the blood vessels and lymphatics, and their elimination by the ordinary excretory channels. All that remains in such cases, after complete recovery, is a mere shapeless shred of lung tissue firmly attached to the ribs by bands of fibrous tissue, while the unaffected lung is perfectly healthy and greatly increased in size. Such an animal would not be likely to convey infection to a herd after recovery is complete. There are many other cases in which a considerable portion, but not the whole, of one lung is involved in the disease action. This diseased portion degenerates, dies, and is absorbed and eliminated in the same manner as the other, leaving a considerable portion of healthy lung, rather irregular in shape, with cicatrices or scars, indicating where the healthy lung tissue had come together and united, after the removal of the intervening dead portion, and the whole of this irregularly shaped portion of the lung is usually attached to the ribs with a variable number of strong bands of fibrous tissue. There is no reason to believe that cases such as these even would be capable of conveying infection to healthy susceptible cattle after recovery. It will be readily understood, however, that the appearance presented by the diseased lung in pleuro-pneumonia, even in cases analogous to the above, vary greatly, depending on the interval after recovery that the *post-mortem* examination is made, and even when the examination is made many months after recovery is apparently complete, there are numerous cases in which the diseased and degenerated tissue is not wholly removed, old abscesses containing degenerated products in a semi-fluid condition are met with. But these abscesses and cysts are usually so completely separated by their surrounding

membranes from the healthy lung tissue, that I do not think it likely that the lungs so affected would be capable of giving out infection. But apart from these somewhat doubtful cases, there are many mild or abortive cases in which the progress of the disease in the lungs is very slow, and appears to be arrested in its course after involving but a limited portion of one or both lungs. Instead of this portion undergoing a rapid process of degeneration, and ultimate removal from the lung, the disease appears to assume a chronic form, and the tissues undergo a process of low organisation, more especially around the borders of the diseased portion. In such cases the disease is apt to revive in the affected lung at an indefinite period after apparent recovery, and such animals are capable of conveying infection to any susceptible cattle with which they come into close contact. These are the cases which are represented as having contracted the disease a second time, but it would be more correct perhaps to say that the diseased action had never completely ceased in the affected lung. At any rate, there can be no doubt that such mild and chronic cases are capable of conveying infection for many months, and even years after their apparent recovery, and as it is practically impossible by an examination made during the life of the recovered animals, to distinguish between those which are entirely free from infection, and those which are not, the only safe course to adopt is to kill every animal which manifests the slightest indications of being affected, and thus free the herd from further danger from within.

But it would be practically impossible to carry out such a measure of slaughter thoroughly without the cordial co-operation of the cattle owners of the Colony. In the first place, unless reasonable com-

pensation were granted, owners would not promptly report outbreaks of the disease, but would try to conceal it as much as possible; and in the second place, the Stock Boards, composed as they are of farmers, would not enforce the immediate slaughter of affected animals, more especially the mild cases, which, as I have pointed out, are the most dangerous.

If cattle owners were, however, certain of obtaining fair compensation for all affected cattle compulsorily slaughtered, on condition only that they reported every outbreak of pleuro-pneumonia as soon as it was observed, and on the other hand they were made liable to a severe fine if they failed to do so, and in addition ran the risk of losing the compensation which they would otherwise have been entitled to, owners would have every inducement to report an outbreak of the disease among their cattle immediately it was observed; and as a further inducement to carry out effective inoculation, I would recommend fair compensation for the loss of any animals which die from the effects of the operation if it is performed by a certificated inoculator. The expense to the public revenue would not be great if these measures were carried out promptly; in fact they would be very little in comparison to the loss annually sustained by the ravages of the disease.

Another great advantage of the prompt slaughter of every affected animal would be to facilitate the immediate inoculation of the remainder of the herd. At the present time, and especially in the Native Territories, this disease may be prevalent in herds of cattle for weeks and months, and no inoculation carried out, the plea being that no suitable virus can be obtained, whereas the real cause is the unwillingness of any Native to kill a beast in an early stage of the disease—the only suitable time for obtaining proper virus—unless he is paid for it.

Market Reports.

Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co., under date 17th, write as follows:—Bad as matters agricultural were a fortnight back, there can be no denying the fact that the pros-

pect of a mealie crop is now beyond the bounds of possibility. The Government now anticipate that the shortage will necessitate steps being taken to provide for the Natives; and produce

dealers in the city, discussing this matter, consider that it would be wise on the part of the Government to suspend the duty on imported grain until next season; and as the bulk of our farmers will, this year, have to be purchasers instead of producers, many of them are of the same opinion.

Mealies.—Practically, there are no Natal mealies for sale, and Durban importers are asking 21s. per muid for North American grain. Unfortunately, stocks are very low at the Port, with the result prices are steadily advancing.

Forage.—From 7s. 4d. to 9s. 1d. per 100 lbs.

Hay.—The market has been better supplied during the past fortnight, and prices are more in favour of the purchaser. Although as much as 5s. 1d. has been paid for some samples, fair quality has been as low as 2s. 6d. per 100 lbs. Bedding from 5s. to 38s. per load.

Onions.—From 7s. to 15s. per 100 lbs.

Potatoes.—While some samples have been as low as 2s. 6d. per 100 lbs., good samples have realised 12s. 3d. per 100 lbs.

Mabele.—Very scarce, and prices have been in the vicinity of 14s. to 15s. per 100 lbs.

Tobacco.—Only small lots disposed of; 5d. per lb. being about the average.

Lucerne.—From 3s. 6d. to 5s. 6d. per 100 lbs.

Pumpkins.—About 10s. 6d. per doz.

Butter.—Some samples have been as low as 10d. and 1s. per lb.; but good palatable butter has realised from 1s. 8d. to 2s. 3d. per lb.

Eggs.—From 1s. 11d. to 3s. 10d. per doz.

Poultry.—Common fowls from 1s. 7d. to 3s. 9d. each; geese, 7s. 6d. each; ducks, 6s. 6d. to 7s. 6d. per pair; turkeys, cocks, 7s. 6d. to 14s. each; hens, 4s. 6d. each.

Sundries.—Mutton from 5½d. to 10d. per lb.; beef, 4d. to 6d. per lb.; pork, 3½d. to 6½d. per lb.; hams, 7½d. to 9d. per lb.

Vegetables.—Although there is a fair variety offered, the amount is small and the quality poor; beetroot, bringalls, cabbages, carrots, chillies, lettuce, radishes, and rhubarb comprise the varieties offered.

Fruit.—Apples, bananas, grenadillas, grapes, mangoes, oranges, pears, plums, peaches, and pineapples have been offered daily; in addition to which a quantity of Cape fruit has been sold.

Firewood from 7d. to 10d. per 100lb.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade remains dull, and money is tighter than for several years past.

Mealies.—The crop both on the coast and up-country promises to be considerably below the average, and probably not more than half last season's record bumper. The dry summer has, undoubtedly, contributed to this result, and importation will have to be resorted to later on. Present importations are quite inadequate, and the demand greatly exceeds supply. Quotations nominally are 20s. to 21s. for best whites.

Potatoes.—These are in full supply, and enquiry small. About 12s. per bag is the price for really good qualities.

Forage is in moderate demand, and fetches 10s. 6d. per 100 lbs. for prime quality.

Hay.—There is a larger enquiry, but very little has been cut up to the present. As much as 80s. per ton is being asked by farmers, and

when rail carriage is added it means a prohibitive price to the buyer, as lucerne is relatively cheaper and far better feed.

Mabele.—Growers report almost complete failure of crop, so that quotations will be more or less nominal unless the article can be imported.

JOHANNESBURG.—Mr. W. H. Thomas, Commission Agent, P.O. Box 1,960, writes:—

The market still continues to be slumpy in some lines, but mainly in potatoes—splendid samples going very low. In other lines, again, the market is much harder. Forage, mealies, Kafir corn, and bran; these lines have been very good the last week, owing to the Cape Colony market in forage having risen by about 1s. 6d. to 2s. per 100lb. Mealies and Kafir corn, especially red mabele, are in demand again. Several enquiries for geba have also been made; only a few bags were offered this week, and they realised 31s. per 203lb. The prices are as follows:—

Barley for Seed.—Several different kinds have been offered and ranged in prices from 19s. 6d. to 23s. 6d. per 163lb. bags, according to quality.

Barley, Green.—This is very scarce now, and several small bundles have been sold at about 30s. to 32s. per 100 bundles, and this is for barley being cut for the third time.

Bedding, Grass, from 8s. to 40s. per load.

Bran.—This has been in demand this week, and realising for a few parcels that were offered at 11s. to 11s. 9d. per 100lb. bags.

Butter.—Owing to the market being full up with Australian butter, the prices realised for Colonial Fresh are very small indeed, being from 9d. to 1s. 6d. per lb.

Chaff.—Several parcels have been sold, ranging from 7s. 6d. to 8s. 6d. per 100lb.

Kafir Corn also in demand, and ranging from 28s. 6d. to 31s. 9d. per 203lb. bags.

Forage.—The market was not so well supplied this week, and prices were much harder; 8s. 6d. to 11s. 9d. per 100lb.

Onions.—The prices were firm, although the market was almost over-supplied; 14s. to 19s. 6d. per 125lb.

Potatoes.—This line is slumpy still; good samples, 20s. to 24s.; medium, 12s. 6d., 18s.; inferior, 2s. 6d. to 8s. per 163lb.

Fowls, 2s. 6d., 5s.; ducks, 5s. 6d., 7s.; geese, 7s., 10s.; turkeys, hens, 8s., 10s.; cocks, 15s., 20s. each.

J. RAW & CO.'S SALES.

On Thursday, 5th March, 1903, at Howick under the auspices of the Howick Farmers' Association, Messrs. J. Raw & Co. conducted a sale of stock, when the following prices were realised:—Rams, £2 15s., £1 10s.; wethers, 28s.; oxen, £14 10s., £15 10s., £15, £20 10s., £17, £20, £18, £18 10s.; young oxen, £10 10s., £9 5s., £11 15s., £12 15s., £11 5s.; cows, £10 10s., £12, £15, £12 10s., £11, £17, £8; cows and calves, £22 10s. heifers, £11; geldings, 10 gns.

On Wednesday, the 11th March, at Mooi River Station, under the auspices of the Mooi River Farmers' Association, Messrs. J. Raw & Co. conducted a sale of stock, when the following prices were realised:—Rams, 15s., 20s., 40s., 65s., 45s., 32s. 6d.; wethers, 22s. 6d., 27s.; ewes, 22s. 3d.; cows, £13, £12, £15; bulls, £15.

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AND MINING RECORD.

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Drenching Cattle.

THERE is much ignorance in the Colony on the subject of drenching cattle. Kafirs, practically always, and the majority of colonists very often, draw out the beasts' tongue when giving a drench. This practice is wholly wrong and extremely dangerous. If the tongue of the animal is hauled outside the mouth, swallowing in a natural manner is impossible, and the liquid given is most liable to go down the windpipe (*trachea*.) By pulling the tongue the valve of the windpipe (*glottis*) is more or less opened, and the gullet, which gives into the stomach, is also partially closed. Acci-

dents are common, two of the most frequent being choking, which often ends in speedy death, and traumatic pneumonia arising from irritation, which also often terminates fatally. The proper method to administer a drench is simple. The operator stands at the right side of the beast with his back to the shoulder of the animal. Putting his left arm round the face of the beast he opens the mouth by introducing his fingers in the space in front of the grinders in the upper jaw. Keeping the head in an horizontal position he pulls it slightly round to the right, and with the right hand he gives the

drench from a horn or a bottle. The illustration appearing elsewhere will assist this explanation. Thus administered, the animal swallows the drench without difficulty. If the patient should be obstreperous and strong the thumb

and forefinger or second finger of the left hand may be introduced into the nostrils, when by grasping the partition (the *septum*), the beast will be easily controlled.—W.F.

The Supplying of Vaccines, etc.

THE Government Bacteriologist and Director Veterinary Department requests that the appliances for vaccines, sera appliances, &c., and all communications concerning such, with remittances,

&c., may be forwarded direct to the Laboratory, Pietermaritzburg, in order to save trouble and possible delay in despatch or acknowledgment.

District Reports.

HOWICK, 26th March.—During the past month the weather has been unprecedented as regards extremities of heat and cold. On the 7th inst. the maximum temperature was 96 degs., whereas on the night of 20th inst. a hoar frost was experienced throughout the Division, which was repeated on 21st inst., but only in parts of the District. These frosts, which have been followed by hot winds, have proved disastrous to the crops which, owing to the dryness of the spring, were planted late, but were, in some parts, looking fairly well. Excessively dry weather continues, only 1.84 inch of rain having fallen since 1st inst. Hailstorms have been numerous in parts of the Division, and have tended to backen and destroy crops, so that these vicissitudes with the rest combine to make the outlook for the District rather gloomy. Mealies continue to sell at a very high figure, and it is hoped that speculators will see their way to import largely. Famine is already rife among the Native population, who, with their usual improvidence, neglect to turn out to work until the pangs of hunger are beginning to be actually felt. The much-dreaded horsesickness has made its appearance, and has destroyed a number of horses, and has not merely confined itself to Native horses running on the veld, but has attacked animals which have never left the stable except in the middle of the day. Stock, with the exception of a few flocks of sheep suffering from Scab, is in good condition and free from disease.

J. W. CROSS, Magistrate,
Lion's River Division.

MAPUMULO, 24th March.—A good fall of rain was registered on the evening of the 19th, which will prove a boon to late crops, such as beans. The amabele crop in this District has been destroyed by the aphid, and is a complete failure. In the Thorns, owing to drought,

there will be no mealies reaped this year. There is a prospect of a threatened famine among the Natives, and mealies are likely to rise to still higher prices, and even now they are almost prohibitive, storekeepers asking £2 per muid. Those Natives resident on the higher lands have very fair crops of mealies, as rains have fallen in these localities. However, it is an ill wind that blows no good, and, possibly, scarcity of food may induce the many idlers to leave their kraals and seek employment at a lower wage than it is their wont to demand. Stock in the Division is clear of disease, though several horses have succumbed to horsesickness, which, on the higher veld, has hitherto been practically unknown. However, in each case it has been apparently due to the fact that the animal has been allowed out in the early morning. An up-country horse-breeder of many years' experience has informed me that horses may be allowed to graze till late at night without danger of contracting the disease, but must imperatively be kraaled or stabled before sunrise, as the dangerous period is from the moment of sunrise till noon. Those who have followed this practice have rarely experienced loss. The Veterinary Department is alive to the dangers of the spreading of rinderpest by Natives, and has effected a cordon of guards under white supervision along a portion of the Tugela River in this Division, adjacent to infected area in Zululand. There is a similar cordon between this and Krantzkop Division, where the disease has existed for some months. It is to be hoped their efforts may prove successful, since this Division is fairly well stocked with Native and other cattle.

GUY V. E. SERY, Acting Magistrate.

Natal Creamery.—The average milk test, taken on the 24th March, was 4.58, which is equal to 19.50 of milk to 1lb. of butter.

Correspondence.

To the Editor Agricultural Journal.

SINGLE OX HARNESS.

DEAR SIR,—Never having seen oxen worked singly, I would be glad of any information as to the style of harness used. I am desirous of using an ox for pulling a cultivator. — Yours faithfully,

H. A. FERGUSON.

"Cymru," Umsinsini.

[Mr. Ferguson need find no difficulty in single harnessing a quiet ox. When farming in Mooi River I used for several years a single ox, a quiet after-one, for mealie scruffling. I have now forgotten who told me of the plan, and I have never seen it put in practice either in Natal or in those parts of the Transvaal or Orange River Colony with which I am acquainted. The plan is simplicity itself. Take an old horse collar and put in on the beast *upside down*. For traces I used rope. There is the harness complete, and from dealers in second-hand saddlery it can be purchased for a few shillings. Of course a voorlooper will be necessary, also a muzzle, if the beast is to be worked in a crop. The muzzle I made of hoop iron—a round band with two cross pieces, and fixed in position with fine wire through punched holes. The muzzle was about the size of a big pudding basin. Stout fencing wire would probably suit as well. The muzzle is held in position by a piece of reimpje going over the head behind the horns. Of course a horse is preferable, in so far as he walks quicker and should require no leader, but where circumstances and conditions point to the using of ox-power, the simple and easily obtained harness I have described will in all respects be found excellent.—H. RYLE SHAW, Ed., *Ag. Jnl.*]

THE SOUTH AFRICAN YOKE.

SIR,—I have much pleasure in acknowledging my indebtedness to the *Journal* for the illustrations of the harness.

I have often wished that I could in-span one ox for scuffling and such light work. Two oxen are one too many for the work, besides being clumsy at turning on account of the long scuffling yoke.

I have used a horse for the work lately, but this has meant keeping an animal for whom I have work only during a few months of the year, and as he is now too old to last much longer his inferiority to an ox is emphasized still further: for while I could fatten an old ox and sell him, the old horse is bound to be a dead loss, as there is no demand for sausages round here.

Now, No. 56 on your plate suggests that breast harness, put on upside down, can be easily adapted for harnessing an ox, and if I have any mealies to scuffle next year I shall certainly try the experiment.

But when we are advised to discard our African yokes for general farm work in favour of harness, or of the clumsy Australian yoke, I for one must decline the advice, until those who advocate the change have made out a stronger case than they have yet done.

Mr. Sinclair mentions that he rode transport with twelve oxen in American yokes. I have done the same with Natal yokes, and had no trouble, so that proves nothing. Many of the more capable transport riders loaded 80 or 90 cwt. and upwards with 16 or 18 oxen, and although the actual weight per ox is less than for 12 oxen and 60 or 70 cwt., yet on soft roads the latter is the easier load of the two, for a wagon with 3 tons on will often cross a vley without going over the felloes, where one with 4 tons would sink to the naves.

In Mashonaland, too, where the roads are very heavy (the country being very sandy) 10,000 lbs. was a not uncommon load, and some men loaded much more, and there nothing but the African yoke is used.

Now, I think I have shown that there is as great a difference between the loads

drawn by two men using the same yoke as between two using different yokes. This difference of result cannot, therefore, be due to the yokes, but to the men or to the oxen. I believe also that all the heaviest pieces of machinery, without exception, were carried to the Gold Fields by Natal yokes.

And this brings me back to my contention in a former letter, that it is the men who use them, not the yokes, that are inefficient.

If Mr. Pearson can prove that an ox will pull more willingly in an Australian yoke, with a bad driver, than in a Natal one, then I will admit the superiority of his yoke.

Mr. Lillenthal, however, is hardest on our Colonial yokes. He seems to imply that it requires two or three men to inspan 8 oxen in Natal yokes, while he has seen one man inspan 16 in Australia. This certainly seems a little hard on our yokes! Then he tells us that two picked oxen in Germany, in harness, can pull a load of $2\frac{1}{2}$ tons at the rate of 3 miles an hour, on level ground, except for sand heaps placed at intervals (the weight of vehicle included in the load), and Mr. Pearson thinks that nobody using Natal yokes would dream of the possibility of such a feat.

I can't say that I am at all impressed by this feat, though, of course, it all depends upon what height and breadth the sand heaps are made. If Mr. Pearson really doubts that it can be done by two oxen of about the same weight in a Natal yoke, I will be very pleased to prove to him by demonstration that it can: say on the Market Square the next time my wagon is in town.

Mr. Pearson's criticism on my former letter calls for some remark. He accuses me of going off on a side issue, and not treating the subject as a whole. My letter was not intended to treat the whole matter, but merely to correct a serious mistake of Mr. Pearson's in his description of how choking is caused by a Natal yoke. We are represented by him as using a yoke with the staples so placed that when the ox pulls the skeys tip up and cause the strop to choke him. This I consider as equivalent to publishing us

to the world as so many fools, for I suppose this *Journal* is exchanged into many other countries, and men who would continue to use such a yoke can only be considered as fools. Now I for one strongly object to Mr. Pearson's description going uncorrected, and I think I am entitled to ask him to correct it, or to show that my correction of him is wrong.

Then I am accused of wishing to adapt the ox to the yoke rather the yoke to the ox. I don't think this can be deduced from my letter. I was careful to point out that the proportion of oxen that choke in a Natal yoke is very small, and suggested that by using picked oxen, and less of them, the same amount of work could be done; and this, as I understand his letter, is the very result Mr. Pearson wishes to achieve. The difference is, that the method by which Mr. Pearson wishes to achieve it would be far more expensive and troublesome to the farmers than mine. First we are to discard 50,000 yokes now in use (I take Mr. Pearson's estimate of the number of working oxen in the Colony), worth, say, £15,000, and to replace these with 50,000 sets of harness, which would be always needing repairs, and would probably cost at least £25,000, or with the 30 or 40 thousand yokes of a more expensive pattern than our present ones, and all this without having proved that we would be any better off after the change than we are now.

Much is made of the fact that the Natal yoke does not suit all of our oxen. Would the Australian yoke be as generally adapted to them as ours is? I have seen an ox badly crippled by an American yoke when not properly adjusted, and I suppose the Australian is the same.

I once also heard of a span of oxen in these yokes pulling a top-heavy load of fodder in a Scotch cart. They stuck fast at the foot of a steep little pinch, the front oxen jibbed, and the cart tipped up and hung the unfortunate after oxen in front of the unfortunate driver's eyes. I did not myself see this accident happen, but perhaps Mr. Pearson can

tell us whether it is possible, or a mere libel on the Australian yoke!

Before closing, I would like to say a word on the variation of the Natal yoke, as introduced by Phipson Bros. and a Maritzburg firm. The increase of the neck surface of the yoke is probably an advantage, while the substitution of a bow for the skeys appears to me a decided improvement, and I would certainly advise anyone requiring more yokes to give these a trial.—Faithfully yours,

PETER MCKENZIE.

Seaforth, Polela,
27th March, 1903.

[Mr. McKenzie says that when he is advised to discard the African yokes for general farm work in favour of harness or of the clumsy Australian yoke, he must decline the advice. He has not been advised to do anything of the kind. The first article, to which he took exception, stated that the matter was one requiring proper investigation and practical tests, that it would be thoroughly tested at the Central Experiment Farm, and that when practical results had been obtained farmers would be invited to see these results for themselves. It is exact practical tests that are wanted. They are worth much more than paper argument.—A. N. P.]

Manuring for Profit.

By F. E. WEAVER.

SOME time back Mr. Acutt advocated in the *Agricultural Journal* experimenting with artificial fertilisers. Mr. Acutt is quite right in this matter, and it is through the efforts of enterprising men, such as he, that agriculture will be advanced in Natal. The list of fertilisers he advocated, however, was comprised of those patent varieties that are so generally used in this Colony. These patent compounds are called complete fertilisers, and are mixed ready for use like some kinds of paint. On the face of it, therefore, they cannot give as good results as when their component parts are applied separately.

If the best results are wanted from artificial manures, the advice of authorities who have conducted exhaustive experiments should be followed. Professor Wright, of the West of Scotland Agricultural College, and others, state that potash manures give the best results applied in the autumn. Phosphatic manures should be applied in the spring, *previous to ploughing*. Both these manures should be ploughed in to place them where the roots can reach them. If not, they would remain near the surface above the roots, for they do not leach. On the other hand, nitrogen will leach, and, if applied with the other manures,

would probably be out of reach just as far below. Therefore, apply nitrogenous manures as a top dressing after the crop is sown.

Care should be used in choosing the kind of manure to a crop. Professor Wright found that sulphate of potash gave for potatoes larger produce and more profitable return than either muriate of potash or kainit, also that the potatoes were superior in nutritive value and cooking quality. Kainit is, no doubt, best for root crops, especially mangolds. For tobacco, sulphate of potash gives much the best results.

For ordinary farm crops that come to maturity in a few months Thomas' phosphate powder or a good superphosphate should be used to supply the necessary phosphoric acid. For sugar cane or fruit trees bone dust is necessary, on account of its phosphoric acid becoming available slowly as decay takes place.

All crops require a certain amount of lime, and leguminous crops a great deal, so every farmer should test his soil for lime. If any one plant food is absent the plant cannot make use of the others, even if present in large quantities. In the year 1879, when the agricultural depression in England was so acute, the Marquis of Salisbury made the famous

remark that "if farmers would manure their lands with brains, as a painter mixed his paints, there would be much less heard about agricultural depression." Twenty years later, in 1899, Professor Wright affirmed, in a lecture at Stranraer, "I used to think the one remedy for agricultural depression was a heavy reduction of rent, but I now find that by the skilful use of artificial manures, as compared with the unskilful use, or as compared with the non-use, the farmer would obtain such an increased profit as would practically leave him with his land rent free." Mr. John Milne, Mains of Laithairs, gold medallist of the Highland and Agricultural Society, writes as follows: "Farmers must still be careful to practise economy, true economy consists in applying the proper manures so as to produce superior crops."

If it is so profitable to manure in Scotland, where they have white labour

and heavy rents, surely it will be profitable in Natal. But it all hinges on Lord Salisbury's remark, that "manures must be applied with brains."

To show the growth of artificial manuring in Great Britain, the amount of artificial manures imported in 1901 was £22,000,000 sterling.

There is a great amount of experimental manuring to be done in Natal, for however exhaustive the experiments in other parts of the world, the difference in soils might not give the same results here. But experiments in other parts can form a guide for our farmers, in that it teaches them to use only sulphate of potash as a potash manure for potatoes or tobacco, and so on. Any information I am in possession of I shall be very pleased to place at the disposal of anyone who writes me (Stamford Hill, Durban) for it.

Rainfall Shortage, 1902-1903.

By J. M. HANDLEY.

ALTHOUGH Umvoti County appears from the monthly rainfall returns to have been fortunate in the matter of rainfall compared with other parts of Natal during the abnormally dry summer, it still shows a shortfall up to the end of February of 10.77 inches, compared with the same period, viz., September to March, 1901-1902.

It is argued by some people that a shortage of 10 inches is not so very serious, but, if the position is analysed, one is forced to the conclusion that it is most serious indeed, and for this reason, that there has been an almost entire absence of the soaking three days' rain, such as we used to call them. In February rain fell in the neighbourhood of Greytown on sixteen days, totalling 5.20 inches, and yet on March 23rd, after a further rainfall of 1.58 inch, the country is drying up at a most alarming rate.

It is, of course, useless to talk of prevention of drought, but the question arises as to whether it is not possible to mitigate the severity of drought by conservation of surface water by means of a general system of dam construction, and the preservation of marshy tracts and vleis.

Of late years many square miles of the latter have been drained and placed under cultivation, which is, of course, progressive agriculture, but after a few years this land becomes worked out, and is allowed to lapse into a large area of sunbaked flats of clay soil, while the still open drains carry off the surface water which flows down from the hill sides, and is carried down to the sea in a couple of days by the quickly-flooded and as quickly subsiding rivers.

Without water there can be no evaporation, and without evaporation no clouds except those driven up from the

sea. With large sheets of water and extensive marshy tracts the air becomes humid, and I think it has been pointed out over and over again that in humid climates good soaking rains are the general order of things, and in dry bare countries heavy thunderstorms which simply flood the surface of the land for a short time and drain into the rivers without conferring any very lasting benefit to the thirsty soil.

It would be a very simple matter for farmers to restore this drained and worked-out land to its former condition by closing up the outlets of the drains. The land would then become sodden and marshy again, with an increasingly herby growth of sedges, rushes, and reeds, and gradually accumulate a topsoil of humus and alluvial deposit, and thus recover its fertility far sooner than it otherwise would.

Pound Notices.

THE following stock, unless previously released, will be sold on the 6th May next:—

Moss Dale.—Bay mare, white star, hog mane, deep cut on right hind leg above stifle, and small cut on right shoulder, no brands; bay filly, no brands. Running on the farm "The Mount," Newcastle, and reported by F. J. Devine as too wild to be driven to the Pound:—Chestnut mule mare, branded on left hip broad arrow, on right hip Government cast brand.

Meran.—Red ox, branded C on right buttock, and S or 5 (very indistinct) on right shoulder. Impounded on the 9th March, 1903.

Ingogo.—Chestnut gelding, aged, no brands. Running on the farm "Trek Boer"—Black cow, with white face, branded TO on left buttock, and CU on right buttock; black cow, branded FD and JU on right buttock, and TO on left buttock.

Mooi River.—Four Leicester cross-bred sheep, no distinct brand, smudge of tar on the back, and various ear marks; eight Merino sheep, six without any brand, various ear marks, two branded 3 on right ribs.

Utrecht.—Chestnut gelding, about 15 hands, no brands, white ring of hair on near knee, small white spots on body; bay gelding, about 14 hands, no brands or marks; black cow, branded HAS; brown cow, branded PS; red ox, four white goats, black goat—no brands.

Acton Homes.—Red ox, white face and belly, branded on the right leg EH; black ox, notch on right ear, little white under belly, and brush of tail white.

Dundee.—Black cow, white under belly, white brush, drooping horns, branded AT right buttock.

Weenen.—Black Kafir goat (ewe), white on belly, white on left shoulder, white mark head. Impounded by J. O. Buys, farm "Vresgewaagd," Weenen. Running on Weenen Town Lands.—Blue-grey mare; blue-grey foal (filly).

Ladyamith.—Blue-black cow, branded S on right shoulder, swallow tail in both ears, with slit at back of right ear, large old sear on right side of ribs, tips cut off horns, aged; black and white heifer calf, no brands, about four months

old, offspring of the above cow; red calf, no brands visible, about four months old. The mother of this calf was impounded and has since died.

Mooi River.—Bull red-and-white, branded on right hind leg O, slit in right ear, about eight years old; probable value £10. Impounded on March 20th by N. McKellar, Glenmore, Karkloof. The above animal will be sold at the expiry of one month from this date, 20th March, if not previously released.

Mahlabatini.—Red ox, white patch on near shoulder and on off side; white cow, black marks, wound on udder, with white (?), with red patches; black cow, with young calf. No brands or marks on any of the above cattle.

Thornybush.—Light grey donkey, branded with anchor upside down. Impounded by Mr. Gee, Camperdown.

Estcourt.—Bay mare, fleabitten, marks X, black points. Impounded by order of Natal Police. Said mare followed a Native's horse from Stoffel Buys' farm, Mooi River.

Moguntia.—Bay pony. Impounded by Chief Tom H. Fynn, of Enquabeni.

Port Shepstone.—Little black sow, probable value 5s. Impounded by Matambe on the 11th.

Howick.—Black cow, white belly and flanks, white heart on forehead, white brush, black-and-white heifer yearling calf; red yearling ox; two sheep, branded CA on right side, one of them with one horn. Reported by James Swan, Fern Hill, as running there, and too wild to be driven to the Pound.

It has been estimated, taking 12,000 hogsheds of sugar as an average crop of Antigua, and 46 inches of rain as the average fall, that for each inch of rain beyond the average the island produces 261 hogsheds of sugar.

The campaign against what are left of these is being vigorously carried on. The insects are now all in the flying stage, but instead of being left alone as they have usually been, they are being followed up with the spray pumps, and so successful have these been that the coast locust will be practically wiped out. I notice that the flying locusts do not look as healthy as usual.—"Arator" in the *Advertiser*.

Central Experiment Farm.**REPORT FOR MARCH.****DIRECTOR OF AGRICULTURE—**

THE progress of work on the Central Experiment Farm, Reit Spruit, during the month of March has been very favourable. The work on hand has been the planting of main crops, experimental crops, building, fencing, hay-cutting, and brick making.

A large acreage of ploughing and tree-planting has also been done at the south end of the farm by the Conservator of Forests.

The rainfall during the month has been very disappointing, and quite 3 inches below the average, and the prospects of a good mealie crop are now out of the question, but it is to be hoped the winter crops may prove more successful.

The portion of vley land assigned for winter crops and ensilage has now been re-ploughed, disc harrowed, rolled, and got into fair condition, and planted with buckwheat, medeah wheat, barley, rye, tares, and oats, with a dressing of 2 cwt. of superphosphate per acre.

Good progress has been made on the Experimental Sections, and now fully 700 plots have been got in.

These plots are now at a stage to provide very valuable information to farmers, many of whom, I am pleased to say, have visited the farm and inspected them.

The most striking feature at present is the marked results of the phosphatic manures, superphosphate, in particular, having shown more effect this dry season than either basic slag or bone dust.

Bone dust has been rather disappointing in its results, and only on mealies has it so far shown any effect.

Nitrogenous manures, which have been applied in the form of sulphate of ammonia and nitrate of soda, are showing beneficial results, although in the earlier stages they proved injurious and retarded the germination considerably.

It is observed that the combination of superphosphate and sulphate of ammonia has, so far as present appearances go, given decidedly better results than basic slag and nitrate of soda. Lime

shows no effect on the unmanured soil. Nothing can meantime be said in favour of the potash dressings. It may be mentioned that these manures are bearing equal results on all crops.

A coolie barracks and kitchen have been erected alongside the nursery. An extension has been added to the manure shed for the protection of implements, and now material is being transported for the building of a 12-stalled stable, a harness room, forage room, and Kafir house.

The boundary fence is almost completed, and preparations are in hand for the erection of the sub-divisional fences of the experimental pasture paddocks.

A quantity of hay has been cut and baled.

The weather having been favourable for brickmaking, 150,000 bricks are ready for use.

The stock are all in good working condition, but I regret to say I have had two fatal cases of horsesickness during the month.

ALEXANDER REID,
Farm Manager, Central Experiment Farm.

Weekly Rinderpest Report.

UP TO 31ST MARCH, 1903.

Zululand.

Eshowe District.—12 dead ; 25 sick.

Mahlabatini District.—9 dead ; 7 sick.

Umlalazi District.—No report received.

Lower Umfolozi District.—No report received.

Nkandhla District.—21 dead ; 18 sick.

Nongoma District.—1 dead ; 2 sick.

Hlabisa District.—1 sick.

Vryheid District.

No deaths ; no fresh cases.

Pauppietersburg District.

No deaths ; no fresh cases.

S. B. WOOLLATT,

P.V. Surgeon.

31st March, 1903.



DRENCHING A BEAST.
(See Article.)

Photo by Editor

Veterinary Report for 1902.

By the Principal Veterinary Surgeon, S. B. WOOLLATT, M.R.C.V.S.

FROM the Report by the Principal Veterinary Surgeon to the Hon. the Minister of Agriculture, the following extracts are given :—

During the past year the Department has been severely taxed in endeavouring to suppress the many and various contagious diseases left in the Colony as a result of the war, and when the number of cases of disease which existed in the early part of the year is compared with the number now existing, I think that the most prejudiced person must admit that the Department has been fairly successful, and that the necessary expenditure has been fully warranted.

Rinderpest.—It must be borne in mind that we have no law of practical value to enable us to deal with Rinderpest. While the European owner does all in his power to assist in stamping out the disease, the Native owner is permitted to defy the efforts of the Department, and to be a grave source of danger to the whole community. Indifference and refusal to assist the Department in the suppression of the disease on the part of the Native owner have caused the heavy expenditure in connection with Rinderpest. The absolute necessity for the inoculation of in-contact cattle has been frequently pointed out by me, and has also been recognised as necessary by the majority of the farming community. I am aware that legislation is required in the matter, and no time should be lost in bringing forward the necessary measures to enforce it. The expenditure incurred in connection with Rinderpest during the year amounts to £43,280 9s. 4d., and the revenue £12,188 1s. 3d. In addition to this we have cattle on hand of the approximate value of £10,000, as well as some 7,000 doses of glycerinated bile. Of the £43,000 odd expended, £2,231 7s. 10d. has been paid to Europeans specially engaged to inoculate cattle belonging to Natives chiefly in Zululand, so that it will be seen that the Secretary for Native Affairs' Depart-

ment has benefited to this extent through the vote of the Veterinary Department. Apart from this, as instructed by Ministers, bile has been supplied at half cost price where the Government had to purchase cattle for this purpose, and in cases where owners have preferred to send in their cattle in exchange for bile, half the value of such cattle sent in (value of cattle not to exceed £10) has been refunded. It will thus be seen that the actual expenditure in providing inoculators for cattle belonging to Natives, in bearing half the cost of bile production as stated above, in maintaining quarantine guards on the Tugela River and on infected areas throughout the Colony, and in the general suppression of the disease, has been roughly £20,000. In Natal there have been during the year 205 outbreaks of the disease, with an approximate number of deaths of 2,924 animals. In Newcastle, Dundee, and Umsinga Divisions there were 132 outbreaks; Ixopo, 1; Weenen, 2; Krantzkop, 6; Lower Tugela, 6, and Ladysmith, 58. Fully 80 per cent. of the deaths have been amongst cattle belonging to Natives who refused to inoculate, or who waited until the disease was well established before doing so. With some six exceptions, the mortality from Rinderpest in stock owned by Europeans (infected herds) has not been more than about 4 or 5 per cent., whereas with Natives the mortality has, in some cases, been as high as 70 or even 100 per cent. where the owner has preferred to watch his cattle die and eat the flesh rather than have them inoculated. At the present time there are only two centres of disease in Natal, viz., at Ladysmith and Krantzkop. In Zululand, at the beginning of the year. Rinderpest existed at Nkandhla, and some sixty deaths occurred, but the Natives were induced to inoculate, and at the end of March no disease existed. During June a Native brought some 26 head of cattle right through Zululand to

Bond's Drift from the Transvaal. These cattle broke out with Rinderpest and left the infection all along the road, with the result that at the end of the month the Districts of Eshowe, Ndwandwe, and Mahlabatini were infected with the disease. The disease also about this date made its appearance in Nqutu District, the infection again coming from the Transvaal across the Blood River. As was to be expected from the nature of the population and their views regarding inoculation and the movement of cattle when disease exists, the disease obtained a firm hold in the Province. The Magistrates of Zululand rendered the Department every assistance in their power, and, without this assistance, we should have been helpless, for, as previously pointed out, we have no power vested in us as a Department for dealing with Rinderpest. Since June the number of deaths from Rinderpest up to the end of the year has been, approximately, 2,173, and the disease exists in the following Districts:—Eshowe, Umlalazi, Mahlabatini, Umfolozi, Nkandhla, Nqutu, and Nongoma. It is not, however, very prevalent at present in the Umlalazi, Nqutu, and Nkandhla Districts. It is around the chief transport centres that the disease is most prevalent; and the movement of transport cattle in Zululand has been largely responsible for the carrying of this disease into clean Districts. As the food supply of Zululand is largely dependent on outside sources, to prohibit the movement of transport cattle is not practicable. The chief transport centres have now been declared separate infected areas, and cattle are only allowed to enter or leave these areas upon a certificate that they are free from disease, are salted from Rinderpest, or have been inoculated with bile during the previous four months.

Notwithstanding the fact that the average Native does not understand the necessity for inoculating his cattle until the disease has actually appeared amongst them—and not then in every case—it cannot be denied, from the results obtained in Natal, that the use of glycerinated bile has been successful in suppressing the disease. Glycerinated

bile has been used generally throughout Natal, some 150,000 doses having been issued. Of serum, 2,000 doses only have been applied for and issued. During the year one request only was made for pure serum, and this application came from Richmond, at the time that the nearest Rinderpest in Natal to that District was at Bond's Drift. It will, therefore, be seen that the public generally require bile as the agent for dealing with Rinderpest. Madagascar cattle were chiefly used for the elaboration of bile. These animals were most suited for this purpose, both as regards cost and susceptibility to the disease (100 per cent. contracting the disease when infected). By their use also we were able to save the indigenous stock of Natal from being sent into bile camps. The use of raw bile has been prohibited, except for the second inoculation, and in practice we have found that in the case of a herd in which the disease exists the use of glycerinated bile is attended with less mortality than the use of raw bile. It has been observed that raw bile, when used on an infected herd, has in many cases increased the virulency of the disease. It has been our practice to endeavour to use fresh raw bile for the second inoculation in clean herds when possible, but, speaking generally, from statistics obtained, the immunity conferred by the use of glycerinated bile is equivalent to that obtained by the use of raw bile, unless the animals upon which raw bile is used contract the disease, and salt, when, of course, they have an active immunity. Raw bile, undoubtedly, in many instances, is infective, and therefore must be prohibited as a first inoculation for clean troops if the suppression of Rinderpest is to be successfully carried out. In the Vryheid District the disease has existed throughout the year. A bile camp was formed at Ngotshe in August for the convenience of the residents, and a fair amount of inoculation was done. We could not enforce, however, any quarantine restrictions as the District had not been formally annexed to Natal.

Lungsickness.—This disease during the early portion of the year was very

prevalent in Klip River County and Zululand. Both these places were infected areas under the Lungsickness Act, and the chief source of infection had been from the neighbouring Colonies. Outside these infected areas eight herds were under license. During the year 333 outbreaks of this disease were dealt with in Klip River County, 200 in Zululand, and 47 in the rest of Natal. At the present time there are under license in Klip River County 20 herds, in Zululand 15, and in the rest of Natal 4 (3 in Estcourt Division and 1 in Lower Tugela Division). The mortality from this disease in Natal during the year has been, approximately, 1,355. You will understand that in Zululand considerable difficulty is experienced in obtaining accurate information as to the number of deaths from this disease, and I cannot, therefore, give even an approximate number of deaths. At the present time the great majority of cattle in Klip River County have a considerable degree of immunity against Lungsickness. This has been brought about by the necessity for periodical inoculation against the disease, and in consequence cattle now inoculated in that District with lungsick virus do not in the majority of cases give much trouble from the effects of inoculation. During 1901, when large troops of raw cattle (that is, having no immunity against lungsickness) were brought into Natal from Overberg, and by reason of their being infected with Lungsickness or in contact with it, were inoculated, heavy mortality was experienced in many instances from the effects of inoculation, apart from the actual disease itself, while at the same time in Natal transport cattle and other Natal cattle which had been previously inoculated, and which had a degree of immunity, the losses were only from 2 per cent. to 5 per cent., as compared with some 20 per cent. amongst Overberg stock. This condition of things now exists to a large extent as regards stock in Natal. The Northern Natal stock all have a degree of immunity more or less active, while Southern Natal stock are in the great majority of cases practically green, and as evidence of this we

have experienced heavy losses of cattle from inoculation south of the Tugela, and practically no losses amongst stock north of the Tugela, the same virus being used under the same condition in both cases. The common idea is that the swellings which take place as the result of inoculation for Lungsickness are due to blood poisoning (septicaemia). This is not so in the majority of cases. Such swellings are due to the specific action of the lungsick virus, and in my experience the extent and seriousness of such swellings is in proportion to the degree of immunity existing in the herd or in the individual animals inoculated. Those owners in South Natal who know their stock to be green as regards Lungsickness should at once resort to amputation of the tail, when they have been compelled through an outbreak of the disease to inoculate, and swelling is observed to be setting in. The onset of this swelling after inoculation varies from the sixth to the twenty-first day, and such inoculated cattle should be inspected daily to enable the owner to take prompt measures when it is seen that the swelling is extending up the tail. The amputation should take place if possible above the limit of the swelling. The action of lungsick virus varies, and, as will be seen by D.V.S. Hutchinson's report, he has had considerable success with the use of glycerinated virus. In inoculating green cattle, no matter how skilled and careful the operator may be, there is a considerable risk of loss from inoculation. At the present time there are a large number of cattle which have recovered from this disease (old lungers), and I fear that when the free movement of cattle across the Tugela again takes place many of these animals will prove a source of infection to the susceptible cattle in Southern Natal. It is not claimed that all "old lungers" carry infection, but many of them do undoubtedly; probably those whose lung lesions have led to abscess formation are not infective. The Lungsickness Act should provide for the destruction of all cattle actually suffering from Lungsickness, and this opinion has, I believe, gained consider-

able ground amongst stock owners during the past few years, although, of course, there are many who do not admit it. As with Rinderpest, the great proportion of the outbreaks of Lung-sickness have been amongst the cattle of Natives.

Glanders.—This disease existed more or less throughout the Colony during the year, and has undoubtedly been largely distributed through the sale of infected animals from the remount and other military depots. I am aware, and ample proof has been placed before you, that the Military Authorities disposed of considerable numbers of horses infected with the disease during the past twelve months. Of late they have submitted horses to the Mallein test before selling, but I do not think that it will be denied that animals have been sold a day or two after being tested with Mallein from amongst troops of horses in which clinical cases were shot daily. I look upon this as an abuse of the Mallein test, as horses under such conditions may have been infected just previous or subsequent to the test, when no reaction could, of course, be expected. During the year there have been, apart from the large number of animals destroyed by the Military Authorities for this disease, 94 outbreaks of Glanders in Natal, with some 200 animals destroyed, 99 of which were showing marked clinical symptoms of the disease. 3,000 animals have been tested with Mallein during the year. It will be seen from the reports of the District Veterinary Surgeons, and it is my own experience also, that, with very few exceptions, every case of Glanders which has occurred has been amongst animals bearing the military brand. Mallein has showed itself to be a reliable test for Glanders, and in our experience in Natal we must undoubtedly place most reliance in temperature reactions if the majority of affected animals are to be brought to light, and we, therefore, regret to see that the Military Authorities intend to ignore the temperature reaction (*vide* page 376 Veterinary Record, December 13th, 1902).

Sheep Scab.—At the beginning of the year this disease was prevalent in Natal,

there being 86 flocks under license. The great majority of cases in Klip River County occurred during the early part of the year, and were chiefly brought about by scabby loot sheep introduced from the neighbouring Colonies. Under ordinary circumstances the Estcourt, Polela, Ixopo, and Alfred Districts are the chief centres of Scab in the Colony, and it is the flocks owned by Europeans that are chiefly infected. One regrets to see that in these Districts there are negligent sheep owners whose flocks are constantly under license for Scab, and who are a grave source of infection to the District. That clause in the Law which allows an owner to obtain an extension of time for dipping during a certain season of the year is very largely responsible for the spread of the disease, and it is seen that the disease invariably becomes more prevalent at this time of the year. Dipping should be made compulsorily during December in those Districts in which the disease is prevalent. The fines imposed by the Magistrates for contraventions of the Scab Law are in most cases ridiculously small, and the Department is in consequence much hampered in efficiently carrying out the Act. No provision is made in the Law to enforce measures against re-infection of a flock after dipping, and as many owners do not usually provide against this re-infection, or have not the facilities for doing so, it is one of the most common means of maintaining Scab in a flock. It is rarely seen that an owner of sheep prosecutes his neighbour for allowing scabby sheep to enter his clean flock, although the Law makes provision for this; if more actions in this direction were taken it would greatly assist the Department. It is a common thing for an Inspector to report an outbreak of Scab in a flock, infection being due to the neighbour's sheep which are under license for Scab. The Orange River Colony and Transvaal have now introduced stringent laws regarding Sheep Scab, and as these countries have adopted such measures Natal should at once amend her present Scab Law with a view to the eradication of the disease. It was the intention of the Government that a Commission

should enquire into the measures to be adopted for the eradication of scab, such Commission to be representative of all South African Colonies, with a view to measures of a similar nature being applied throughout. As, however, the other Colonies concerned have already decided upon their measures, Government should take action in this matter.

Mange in Goats.—This is a legacy of the late war, and has been responsible for the death of several hundreds of goats during the past year. It is not due to the same parasite as Sheep Scab. Owing to the causal parasite of this mange burrowing under the skin it is much more difficult to cure than Sheep Scab. The parasites of Sheep Scab do not, as a rule, attack animals with hairy coats. They can be carried by these animals, however, but do not propagate on them. More energetic measures are required to eradicate Mange in goats than Scab in sheep.

Mange in Horses.—This disease during the past two years has been disseminated throughout Natal. It was particularly prevalent during autumn and winter months last year. This and other skin diseases of horses has been brought to Natal from nearly all parts of the world by indifferently inspected horses for the Remount Department. The disease became prevalent among the many loot animals that were constantly being disposed of by the Military Authorities. Large numbers of mangy animals have been sold throughout the Colony, both by public auction and by private sale, and many dealers in horses, and I regret to say farmers have been guilty of giving small prices for emaciated mangy horses rather than let them be shot, and have at once disposed of them to Natives and coolies. I do not think there are many of the loot animals which were sold by the Military Authorities now left. They have practically all died of either Mange, Influenza, Biliary Fever, Strangles, or Glanders, all of which diseases were more or less prevalent amongst them. Mange has been responsible for the death of hundreds of horses during the year; very many Natal horses have died from

its effects, and the loss in foals and from abortion has given the horse breeding industry of this Colony probably the most severe set-back it has received. The great majority of the troops of brood mares have been affected during the year, entailing much expense on the owner, apart from actual loss. In fact during last winter the majority of animals in the country were affected, and the Native owners took no precautions against its spread, nor endeavoured to cure it in any way. Mange was brought under the provisions of the Contagious Diseases Act of 1894 early in the year, but as this Act does not confer any powers on the Veterinary Department for dealing with this disease, it has not been of much use to us. The great majority of European owners took drastic measures to clean their horses, entailing considerable expense, but the Natives and some military camps still continued to disseminate the disease during the early part of the year. The disease during the past summer has shown itself to be much more amenable to treatment. As is usual with parasitic skin disease, when the animals become in good condition in summer the disease is much more easily eradicated, and among animals which are not treated some may recover or carry only few of the parasites, which are not very noticeable, the amount of irritation being small. It is anticipated that the disease will again be prevalent during the coming winter, and it is essential that powers similar to those of Sheep Scab should be given to us for its eradication. The only practical way of dealing with the disease is by means of a dip if any number of animals are to be treated. Mange is, therefore, an addition to the other reasons why the building of dips throughout the Colony should be encouraged. Mange has been in existence to a less degree among cattle, and has assisted considerably in causing the loss of many during the past severe winter. Owners should keep constant watch for the re-appearance of Mange amongst their horses or cattle in the coming autumn; during the summer when animals are in good condition and the

natural fat secretions of the skin are plentiful, although mange insects may exist on animals in small numbers they are not always apparent. With the onset of winter and the consequent loss of condition, they soon show up however. There is no doubt that drastic measures taken at the onset are always warranted.

Redwater and Gallsickness. — These two diseases are dealt with together, for if they are not phases of one and the same disease, their symptoms, *post mortem* lesions, clinical history, distribution, and sources of infection are so allied that it is difficult to determinate which we are dealing with in all cases. They are both forms of bovine malaria, and the most common source of infection is the tick or other blood-sucking parasites. The distribution of these diseases in Natal, we may say, is general; some districts, of course, being more prone than others, but it exists everywhere in Natal if susceptible animals be exposed. Speaking generally, those animals which pass, or show on *post mortem*, blood-coloured urine are returned by laymen as Redwater, and those showing no discoloured urine as Gallsickness. The great majority of these cases (discoloured urine or not) are due to the Redwater organism. Some cases of acute Redwater are returned as Melsickness when the spleen is much increased in size. In my experience, at least 30 per cent. of undoubted cases of Redwater show no discolouration of urine; the liver, spleen, stomach, heart, and kidney, are the chief seats of the lesions of Redwater, and yet the great majority of owners, if on *post mortem* they see no discoloured urine, return the case as Gallsickness, or, at least, not Redwater. Districts which are bad for Redwater are also bad for Gallsickness, and animals susceptible to one are susceptible to the other. The symptoms are very similar, and if one takes careful notice and recognises the various acute, sub-acute, and chronic form of Redwater, they see how similar the two diseases are. I refer, of course, to those whose ideas are not so conservative as to prevent their looking upon cases in an unprejudiced manner. This disease has been accountable for the deaths of large numbers of cattle throughout Natal,

particularly in the Klip River County among the Overberg stock, and generally it has been more prevalent in Natal among indigenous stock than usual. Large numbers of imported susceptible animals, introduced for slaughter and other purposes, have been allowed to travel through the Colony and contract and die of acute Redwater *en route* or at their destination. This state of affairs is a distinct danger to the local stock, for wherever a case of acute Redwater occurs the virulency of the local infection is increased. I am strongly of opinion that the importation of animals undoubtedly susceptible to Redwater in large numbers should be prohibited. The annual loss amongst indigenous stock of Natal from Redwater is very considerable when taken aggregately, and it behoves the Government to adopt measures with a view to lessening the mortality. With our present knowledge of Redwater, I am of opinion, and this is shared with many others, that the only practical method to adopt is to direct our attention to the tick. The tick is responsible for the carrying of many diseases, and if we could eradicate this parasite it appears from the evidence we have that such diseases as Redwater, Heartwater, probably Malaria or Biliary Fever of horses, and other diseases, would practically disappear also. Apart from the fact that the tick is the carrying agent of many diseases, it is generally recognised that this parasite (the tick) is responsible for an enormous loss to the farming community for the following reasons: — Loss in condition in all stock; loss of milk in cows. Much expense is incurred in endeavouring to free animals from this parasite and probably a very large percentage of the mortality among young calves during the months of January and February is attributable to the tick. I think it is generally recognised that the system of endeavouring to keep animals fairly free from tick by hand labour is too expensive and too unsatisfactory. The system of dipping is undoubtedly the only practical method of dealing with the matter. No danger is attached to the dipping, and it is most effectual and not costly. Full details regarding the building, working, and dipping agents used have appeared in the *Agricultural Journal*, and many through the

courtesy of J. Baynes, Esq., have had an opportunity of seeing the practical working of the system and its satisfactory results demonstrated. I am strongly of opinion that all farmers who possess from 100 to 200 head or more cattle, particularly where ticks are prevalent, would find it most economical to erect a dip. Up to the present it has been found that the arsenical dip is the most efficacious. It is stated that no danger exists in dipping cattle. This is so if ordinary precautions are observed. Animals, after the first dipping particularly, are seen to be a little ailing for the first week; cows usually go off their milk for a few days, and oxen have been observed to be easily exhausted and to suffer from heat apoplexy if used within a few days of dipping. This condition is not so noticeable after the first few dippings, as the animals appear to acquire a tolerance to its effects. After the first few dippings, I think the quantity of arsenic may be increased from 6 lbs. to 8 lbs. per 400 gallons without deleterious effects on the animals, and to ensure the more thorough destruction of the tick. I am of opinion that if dips become general throughout the Colony, and I trust they will, it will do more for the cattle breeding industry of this country than anything done previously. It is quite possible and practicable to effect the eradication of tick by means of periodical dippings. The tick is unable to propagate without maturing on a host, and by preventing these parasites from maturing on their hosts, and thus becoming in a condition to propagate, they must diminish and eventually be eradicated. To more effectually bring about this condition, all animals which carry ticks should be dipped. It should be borne in mind that with the destruction of the majority of ticks in an area, the immunity against Redwater, which the local cattle have acquired by means of the constant infection, will diminish perceptibly in proportion to the diminished number of ticks. Thus it is expected that cattle when moved from an area in which the ticks have been practically eradicated for a considerable time, and taken to a place where ticks exist abundantly, many would contract Redwater and Gall-sickness. I think that legislative powers

should be given to compel dipping of cattle in badly tick-infested districts, or at least to prevent the movement of such cattle without their being dipped. It is hoped that stock-owners generally will recognise the value of dips, and many will be erected within the next twelve months. Natives appear to appreciate their use, as seen at the dipping tanks which have been erected. Three tanks exist at present, viz.: Nel's Rust, Groote Vlei, Howick, and at Buccleugh, New Hanover. It is hoped that a dip will shortly be erected at the Government Experimental Farm at Hilton Road. A first-class dip can be erected for a little over £200, and I expect to shortly see some dips put up as a matter of business, the owner charging so much per head for dipping, as is done in Australia.

Rhodesian Redwater.—This disease appears to be confined, as far as we are informed, to the area around Nomahashi, in Swaziland, as the nearest centre to Natal, but I fear it may reach our borders by means of transport cattle coming from Barberton or Lydenberg Districts. Outbreaks have occurred at Lorenzo Marques and elsewhere in East Africa, and in the Transvaal. Cattle from these countries are prohibited from entering Natal, and measures have been taken to guard against the introduction of cattle across our northern borders, but oxen in yoke are permitted to come from the Transvaal to Charlestown for the purpose of obtaining loads. We have no guarantee what part of the Transvaal these cattle come from. Transport cattle have been one of the chief means of disseminating this disease, and I have asked, on more than one occasion, that the proclamation which permits of cattle coming to Charlestown from the Transvaal should be withdrawn. I do not think that we may greatly fear this disease should it appear in Natal, provided legislative powers are given to us to deal with it, such as power to quarantine and compel dipping for the destruction of ticks. At present we have no power to deal with it should it appear. The evidence we have from both scientists and laymen goes to show that the infection is undoubtedly carried by the tick, and in consequence any means taken for the destruction of ticks is good policy even if the disease does not exist in Natal,

as it would lessen the number of ticks which might become infected should the disease appear. Dipping will not save cattle from Rhodesian disease, as appears to have been expected in some quarters, after infection has taken place, *i.e.*, after infected ticks have inoculated the animals, but by destroying ticks we destroy the agent which carries the infection, and dipping is successful purely as a preventive, that is by preventing infected ticks from propagating and gaining access to susceptible animals. This disease does not appear to be nearly so virulent on the High Veld. Cases have occurred there, the infection being brought from the Low Veld, but apparently the mortality has not been heavy, and the infection soon died out.

A sum of £1,000 was given to my Department for the purpose of taking precautions against the introduction of this disease, but out of this amount I have had to bear the cost of the Government Bacteriologist's investigation of the disease in Rhodesia, which amounts to £354 2s. 10d.

Mr. Pitchford proceeded to Rhodesia on behalf of his Department. Mr Hutchinson visited the Transvaal at a later date on behalf of the Veterinary Department; his Report appearing in the *Agricultural Journal*.

Horsesickness—This disease was not very prevalent during the year. Some 50 to 60 cases only were reported. Even in such a hot-bed of the disease as the Town Bush Valley, Pietermaritzburg, very few cases of Horsesickness occurred. I understand that the Government Bacteriologist is investigating the disease. From practical observation it appears that the infecting agent is some blood-sucking insect, which chiefly inhabits swampy and damp places. Horse owners who constantly fumigate their stables, or whose Natives are in the habit of cooking their food in the stable (thus smoking them), appear to escape with little loss amongst their horses. Stagnant pools or receptacles where water may accumulate and harbour mosquitoes, should be done away with as much as possible in the vicinity of stables during the Horsesickness season. Colic or abdominal pains are the most common premonitory symptoms of the disease, particularly the

Dikkop form, and symptoms of Colic during the season should be looked upon with suspicion.

Tuberculosis.—Practically no cases of this disease have occurred during the year, and I think we may reasonably claim to be free from it. A suspicious case occurred in the Mooi River District, but the Government Bacteriologist reported negative results from the microscopical examination of the lesions sent to him. Many imported animals have been destroyed in Durban during the year owing to their reacting to the Tuberculin test, and all have shown lesions of Tuberculosis on *post mortem* examination. Tuberculosis has been found to exist amongst cattle from Australia, the Argentine, Madagascar, and England, upon arrival in Durban, and the necessity for the Tuberculosis Act has been amply justified. Until the Cape Colony adopted similar measures owners of reacting animals constantly endeavoured to reship them to that Colony.

Rabies.—Small expenses have been incurred in connection with this disease. No cases have occurred in Natal during the year and regulations have been issued prohibiting the introduction of dogs from all countries except England and Australia. Dogs from these countries are admitted upon production of a certificate of health given by a Veterinary Surgeon of the country from which they came. In consequence of these regulations many dogs have not been allowed to land in Durban.

Malarial or Biliary Fever in Horses. This disease has been very prevalent during the latter part of the year. All imported horses, and many Colonial horses when moved from one district to another are susceptible, and the annual loss from this disease amongst imported horses is probably greater than from horsesickness. The word *acclimatised* when applied to an imported horse usually means that the animal has recovered from an attack of Biliary Fever. The tick appears to be largely responsible for the dissemination of this disease and many of the most acute cases show symptoms and post-mortem lesions very similar to those found in acute Redwater in cattle. With the exception of very acute cases the disease is not nearly so

fatal as Redwater in cattle if the animal can be treated and cared for properly. It is most debilitating, and consequently a long rest is necessary after recovery. Heavy mortality is often experienced in large troops of susceptible animals where the individuals cannot be properly cared for, as was the case in the troop of loot horses which were brought into the Colony during the war. The most marked lesions are usually seen in the liver and spleen. Sometimes, however, the lungs are chiefly affected, and in other cases the intestines. The causal organism, which in most cases can be easily demonstrated, appears to exert its destructive properties principally on the blood corpuscles as is the case also with the organism of Redwater in cattle.

Anthrax.—Several cases (some 20 in all) have occurred during the year in Victoria, Klip River, Umvoti, and Pietermaritzburg County. On two occasions several Natives died from the effects of eating anthrax flesh. Animals which die of anthrax are usually found dead, or seen to be ailing for a few hours only, the symptoms shown during life are not diagnostic; high fever, staring coat, laboured breathing, frequently discharge from eyes is seen, and in some cases blood-coloured urine is voided. After death the animals rapidly become distended with gas. There is a blood-stained frothy discharge from the nose, and frequently bleeding from the annus and inside of thigh. An animal dying suddenly, or found dead, showing these symptoms should not, under any circumstances be opened. Anthrax is not infectious from one animal to another; it is in the contamination of the pasture with the spores of the anthrax bacilli that the danger lies. Wherever blood or fluid from a carcass dead of anthrax is spilt a centre of soil contamination and infection is established. During life, those animals which pass bloody urine establish centres of infection where this urine contaminates the soil. It is highly important that carcasses dead of anthrax, or which have died under suspicious circumstances, be buried intact, and the pastures around the places of death be also limed or burned. It is hopeless to expect Natives to do this, and they most frequently ignore warning as to the danger

of eating the flesh, which frequently results in the death of some of them. If it is desired to definitely decide whether the case is one of anthrax, an ear should be removed and forwarded for microscopical examination.

Quarter-evil.—This disease has not been prevalent, and very small loss has been experienced by European owners, which, I think, may be attributed to the system of preventative inoculation which has been adopted generally. Native owners have, in some cases, experienced heavy loss, but these owners seldom inoculate. Quarter-evil is not infectious from one animal to another; contamination of the soil by animals dead of the disease maintains the local infection. Inoculation, therefore, has a double benefit, and should be resorted to *before* cases occur, and not *after*, on farms where quarter-evil is known to exist, as, by preventing cases, the infection existing on a farm will in time disappear.

Vegetable Poisoning.—Many cases, particularly in cattle, have occurred, both as the result of eating poisonous plants and decomposed vegetable matter. The administration of purgatives, consisting chiefly of Epsom salts, is, as a rule, successful.

Mineral Poisoning.—Many cases have occurred, particularly amongst cattle. Lead has chiefly been the cause, and the majority of cases have taken place in the up-country districts. Cases of arsenic, paraffin, and sulphuric acid poisoning have also occurred.

A disease amongst cattle which, unfortunately, we have not been able to throw much light upon, and which has occurred periodically in the vicinity of Howick, again made its appearance at the end of the year. It has usually appeared during the winter months, but on this occasion it was in the middle of summer that loss was experienced. Cows in milk have chiefly been affected (in some cases the disease has been entirely confined to them), although mixed cattle were running on the same pasture. The animals when attacked show varied symptoms which all appear to emanate from nervous system. The functions of the body appear normal, and on *post mortem*, beyond congestion of the brain, and in some cases, as reported by D.V.S. Webb, an

abnormal condition of the uterus consisting of a thickening of its membranes with coloured excrescences, etc., the organs of the body appear normal. The symptoms during life are as follows:—Animal is noticed first to stagger, to have a prominent eye, to constantly nod its head and to show a disinclination to feed. As the disease progresses, this nodding of the head becomes most marked, particularly if the animal be excited. In some cases partial paralysis of the fore or hind limbs supervenes, and in all cases the animal is inclined to lean its head against a tree or other fixed object, rarely moving round in a circle. There is a marked loss of co-ordination of movement, *i.e.*, the animal can move its limbs, but has not proper control of the movement—the brains being unable to properly direct such movement. Animals when moving about may walk into trees, dongas, etc. The sight is impaired owing to dilatation of the pupil of the eye, but the animal is not blind. D.V.S. Webb has observed a discharge from the vulva of a scanty nature, thick and white in appearance, and marked straining in some cases. Animals usually feed practically to the last, and death in the end appears to be due to exhaustion. The disease is not, as a rule, rapidly fatal, the animal lingering many days. In the case of Mr. Hyslop's cattle the great majority of those affected have died. Various drugs have been tried, with but little success. At the onset, the administration of a purgative of from 1½ to 2 lbs. of Epsom Salts, with 1 drachm of Calomel, for adult cattle, appears to give relief. In the case of Mr. Morton's cattle—he had several affected one winter, and by giving purgatives, and slinging those which showed symptoms of paralysis, the majority recovered, but these cattle do not appear to have been attacked with such a severe form of the disease. Bleeding also appears to give temporary relief. Slinging is not in my experience usually a success in dealing with cattle. The disease has usually appeared while the cattle were running on old mealie fields, and it was thought that some connection existed between this and the disease, but while the locality appears to be largely responsible for the appearance of the disease, the running in old mealie fields cannot be assigned as the actual cause of the disease. Cases

have occurred while the cattle have been running on grass lands. Removal to fresh grazing ground has been found to always stop the disease, and many affected animals recover. On one occasion Mr. Hyslop turned his cattle on to green forage and the disease immediately stopped, and the great majority of the sick animals recovered, and during the last outbreak of the disease, which occurred in December, while his cattle were running on grass lands, by moving them to another farm the disease was checked, and many of the sick animals recovered. We certainly have a remedy by moving the cattle to fresh grazing ground, but this entails expense and, in some cases, loss of milk, which is a considerable item, apart from the fact that, by these periodical outbreaks occurring, the farm becomes practically valueless as a stock farm. I do not think that vegetable poisoning is the cause of the trouble, judging from the symptoms and *post mortems* lesions found, and from the history of the disease. If it were due to a vegetable poison, we should expect to see cases distributed amongst the different classes of stock, and not confined principally to milch cows. Certain post mortem lesions and some blood from sick animals, together with a specimen of a plant which was stated to be a possible cause of the trouble, were forwarded to the Government Bacteriologist, and his report on the morbid specimens is appended. It would appear that no specific organisms can at present be assigned as the cause of the disease. I am inclined to think that probably some material which is necessary for the animal economy, such as salts of lime and phosphates, necessary for the proper nourishment of the nervous tissue, is wanting, either due to overstocking or its absence entirely. If this is so it would appear to account for the great majority of animals affected being cows in milk, as these, by reason of the drain on their system, would appear to be more prone to the affection. As you are aware investigation of diseases on behalf of the Government does not form part of the duties of the officers of the Veterinary Department. This work has in the past been left entirely to the Government Bacteriologist. I am strongly of opinion that facilities should be given to District

Veterinary Surgeons to investigate local diseases, which may occur in their districts, with a view to obtaining some knowledge of practical value as regards treatment. I recognise that the investigation of diseases which require special appliances and much time and expense should be left to the Government Bacteriologist, but there are many diseases that might be termed minor local affections, which, if taken in the aggregate, are the cause of heavy mortality, and regarding which more information is required.

The work in the office here has been heavier than in former years, and we were obliged to have extra assistance. The number of registered papers were 1,529, and the number of letters written were over a thousand, apart from the numerous circulars, etc., issued to the various officers of the Department, and the work entailed in the accounts of revenue and expenditure of the Department. The collection of fees, etc., due to Government for services rendered by the District Veterinary Surgeons is now performed in this office, entailing a considerable addition to the work of Mr. Hime. During the year I regret to report the death of the late Mr. J. P. Bryne, who was a District Veterinary Surgeon for the Umgeni, Upper Umkomanzi, and Ixopo Districts, and the dismissal of Mr. T. G. Palgrave, who was District Veterinary Surgeon for Zululand. These vacancies were filled by Messrs W. Fyrth and C. Tyler. Owing to our taking charge of the Utrecht and Vryheid Districts and to the necessity for the rearrangements of the Districts of the District Veterinary Surgeons, chiefly on account of their former districts being too large and the demand for their services having increased, and to fill vacancies which existed, Messrs. O'Neill, Sharpe, Webb, and Crole, have been appointed. Mr. O'Neill has charge of Klip River, Upper Tugela, and Umsinga Divisions, and Mr. Sharpe the whole of the coast districts, Mr. Webb the Lion's River and Impendhle Divisions (the latter having been removed from the district of the D.V.S. Ixopo and Polela) and Mr. Crole the Vryheid and Paulpietersburg Districts. The Utrecht District has been given to D.V.S. Hutchinson, Newcastle, in the place of Umsinga Division added to Mr. O'Neill's District.

I would specially draw your attention to the large numbers of stock imported at Durban, which have been chiefly for the Repatriation Commissions and the Military Authorities. Many speculators have also imported large numbers of cattle and sheep. The Stock Inspectors in Northern Natal and in Zululand have been hard worked to keep pace with their duties, and many in Southern Natal have had in comparison little to do. The system of paying men a retaining fee to do the work of Stock Inspection, such fee, amounting in many cases to a fair salary, is objectionable. I am glad to say that all the latter appointments have been made subject to the officer giving his whole time to Government, and until this is made general, and the officer subject to removal from one District to another when considered desirable, this branch of the department will not be thoroughly efficient. There appears to be no difficulty in obtaining suitable men for these appointments, who are willing to give their whole time to Government. I am opposed to moving men from one District to another, but it sometimes happens that it is desirable and necessary. In some districts on account of their small size, and scarcity of sheep, the salary paid to the Stock Inspectors is small. I am of opinion that it would be more economical, and more efficiency would be obtained by joining some of these Districts together, and engaging a Stock Inspector at a fair salary, and subject to his giving his whole time to Government duties.

P.S.—It is observed in the annual report of the Government Bacteriologist and Director, Veterinary Department, that reference is made to the suppression of disease and to the vigilance and firmness of the Veterinary Staff. Whilst thanking the Government Bacteriologist for the compliment thus paid by him to my staff, I must at the same time point out that such allusions might lead the public to believe that the suppression of disease and the members of my staff are under the control of the Government Bacteriologist. As my Department and that of the Government Bacteriologist are two separate and distinct Departments under your Ministerial control, I think it will be better in

future if matters appertaining to my own Department (the Veterinary Department) are left for me to refer to. The subsidiary title of "Director, Veterinary Department," held by the Government Bacteriologist, is the cause of endless confusion.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

LABORATORY NOTES ON MORBID SPECIMENS FROM THE COWS OF MR. HYSLOP, OF HOWICK.

On January 16th last a few ounces of glycerinated fluid with a portion of uterine membrane and umbilical cord were forwarded to the Laboratory by the Principal Veterinary Surgeon.

On January 24th the brain of a cow, a small phial of blood, and a fresh specimen of a large fruiting umbelliferous plant were received.

On February 11th a uterus, with left appendages attached, was received: the uterus contained the foetal membranes of an incomplete pregnancy—the specimen was decomposed and highly offensive. On the evening of the same day the report of D.V.S. Webb on the disease, dated January 19th, was received.

Glycerinated Uterine Fluid.—This fluid was stated to be derived from the uterus of a cow which had died from some nervous affection. Microscopic examination did not reveal the presence of any organisms. A guinea-pig received 1 c.c. of the fluid hypodermically, and up to the present date has not developed any symptoms of ill-health. A two-year-old heifer received 20 c.c. as a vaginal injection, and remains at the present date in good health.

Uterine Membranes.—In both specimens of uterine decidua, received January 16th and February 11th, the "Glycogenic Areas" which had come under suspicion as being connected with the disease in question, were well developed upon the inner surface of the amnion. They presented, however, as far as could be seen, no abnormality, but in order to ensure definite statement these bodies were carefully hardened and cut with the microtome. Microscopic sections of the papillary and plate-like

projections showed them to consist of accumulations of hypertrophied cells of the epithelial layer of the amnion. The fact that these excrescences were normal glycogenic bodies, such as those usually found on the amnion of pregnant ruminants, was proved by treating them with weak iodine, the resulting reaction gave the usual indications of glycogen, by immediately assuming the characteristic mahogany-brown colour. No undue significance, therefore, can be attributed to these bodies in the absence of other uterine abnormalities.

Brain.—The animal from which this specimen had been taken had been pithed: the extravasation of blood at the base of the brain produced by this method of slaughter obscured, unfortunately, any appearances which may have been due to the disease.

The brain also had been separated into halves, thus opening the third ventricle, and permitting the escape of intraventricular fluid. As received, the brain showed extensive hyperaemia of the *viv* mater, without any inflammatory exudation. This hyperaemia was most marked upon the basal surface of the anterior, or frontal, lobes. The vessels of the velum interpositum were greatly engorged. Microscopic sections of the hardened anterior lobes showed no abnormality. A trace of fluid in the lateral ventricle was inoculated on to an agar plate and incubated; a pure growth of a micro-organism was immediately obtained. From this pure growth subcultures were made. In the "hanging drop" this organism appeared as a small coccus in short chains of from two to six. It could not be cultivated on ox serum. Two c.c. of a young broth-culture of this organism were inoculated hypodermically into a guinea-pig, but beyond a slight febrile disturbance no morbid process has, up to the present time, appeared in this animal. Cultivations from brain substance immediately beneath the *pia* mater proved negative. In the same vessel in which the brain was received were about ten ounces of turbid, blood-stained fluid. As this fluid appeared to be free from putrefactive changes, 10 c.c. were injected sub-

cutaneously in a young heifer. Sixteen days have elapsed since this inoculation and no indication of any local or general disease has arisen.

Blood.—Examinations of the blood received, both bacteriological and biological, proved negative.

The plant sent, as being the possible cause of poisoning among the cattle affected, was a complete specimen of the *Pastinaca sativa*, or common parsnip. It was in full fruit, and the characteristic tap root was, therefore, small in size. A decoction of one ounce of the fruit and leaves was administered to a heifer in the form of a drench, without producing any toxic symptoms.

One does not feel justified under the present circumstances in looking upon the micrococcus isolated from the cerebral ventricles as the cause of the disease. Beyond the isolation of this organism, the examinations of the various specimens received have not thrown much light upon the disease. It is possible that the lapse of time will be

marked by the development of symptoms in some of the animals inoculated, although there is no reason for thinking that this is to be expected. Nothing to date.

The disease, which appears to affect the central nervous system, is probably one which will require for its elucidation the personal visit of a bacteriologist. Not only will it be necessary to examine the tissues in a perfectly fresh condition, but the surroundings of the animals will require investigation.

It may be definitely stated—

- (1) That the disease is not due to the eating of parsnip plants, and
- (2) That the specimens of uterus and foetal membranes received presented no pathological degree of abnormality. It is open to doubt whether there has been anything more than an accidental association between the disease and the pregnant condition.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list :—

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give

services at first in return for board and instruction. Is interested in fruit growing.

No. 40a.—Aged 26, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barberton District of Transvaal. Is anxious to get work, irrespective to nature of employment.

No. 42a.—Englishman, 24 years of age. Has had life experience of agricultural, stock, and dairy farming in Cheshire, where he had the management of a farm, and gained several prizes for cheese-making. Is anxious to get on to a dairy farm, if possible.

No. 43a.—Is at present a student at the School of Agriculture, Kutt, near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.

No. 44.—Young lady of English parentage, who has had two years' training in poultry farming at Lady Warwick's Hostel, and who has also been at Reading College Poultry Farm, is open to accept an appointment for a year or two, where she will be able to acquire local experience of poultry farming.

The Art of Milking.

THE following article (writes Mr. Challis), taken from the February number of the *Dairy*, should, I think, prove interesting to the readers of the *Agricultural Journal*. Few dairy farmers in Natal will deny that the system of milking in this Colony is bad, and that the art of milking properly is scarcely understood, and, if understood, is with a few exceptions never carried out. I am fully aware of the difficulty farmers have in securing good milkers, as scarcely any are to be had in the Colony, for the Kafir is a self-taught milker, and a very bad one at that. The ideal milker is one who, as nearly as possible, imitates the action of a calf whilst sucking; but the way a Kafir milks is as unlike this as it is possible to be, and he to a great extent, coupled with the non-existence of a proper system of hand rearing calves, is responsible for the number of poor milking cows that we have in the Colony, and, in a certain measure, to the great mortality amongst the calves:—

Milking cows properly is a profession, as we may call it, that concerns every dairy farmer. Though it is a matter of the greatest importance to each farmer individually, yet there are but few who insist upon it being properly done, or are capable of seeing that those doing the work for them perform it in a proper manner. The majority of those engaged in the industry are incapable of instructing others in the art of milking a cow as she should be milked. Were the matter of milking given the attention it really deserves, or naturally demands, the return of each cow at the pail would be more profitable than it is at present, and the total result would be fully 10 per cent. better on each farm. A thoroughly competent milker can see at a glance when walking through a milking shed during the milking time how few there are of those at work really competent in the art of milking, and doing the work as it really should be. The greater number of those engaged in the dairying industry seem not to care a jot how the

milking is done so long as the work is finished by a certain time. The cows can be milked anyhow, so long as all the milk is at the factory or dairy by a certain time, morning or evening, so as no fault can be found for being late by the receiver of the milk at its destination. The majority of those engaged in the work of milking seem to be either very badly trained at the beginning, or else they have been allowed to get into a careless, slovenly habit, by a method of indifferent or indolent supervision.

This is a more serious matter than the majority of dairy farmers imagine, as the work of milking the cows properly is of the greatest importance, as on it depends the future success and natural prosperity of the industry. It not only makes the cows give more milk and greater returns in the produce for a fixed quantity of milk, but it is better for the cows as milkers, as they have no blind quarters or inflamed udders, or sore teats, during the season. It is of frequent occurrence to see cows with blind quarters, as milkers term it. It is only natural that any cow with such a handicap, apart from the pain and inflammation present, for some time after each calf, to be less profitable than she would have been were the udder sound in all the quarters. Many dairy farmers imagine that the loss of a quarter, or even two, does not make much difference, so long as the animal is well cared for in other respects. They forget the pain the animal has to suffer owing to the inflammation of those lost quarters with each calf, as well as the loss of this portion of her natural reservoir for holding the milk previous to being milked. I have known cows that gave ten and twelve quarts of milk for months, but when they lost a quarter did not give half as much, and were not more than three-fourths of their usual time before the loss in milk. The loss of their quarters is in almost every case solely due to careless milking, or not doing the milking in a proper manner. It is lost through careless milking, by

neglecting to strip the cow really dry each milking. The leaving of milk each time many consider a mere trifle, and that it takes up too much time when you are in a hurry. This not only gradually dries the cow off, but the milk naturally congeals in the milk glands, and, in time, the quarter the most is left in becomes blind. Unless you milk thoroughly dry each time the animal's udder becomes more and more inflamed, and the congealment more severe. Many milkers neglect some teats, owing to the fact of a slight deformity being present, or it may be a little "tougher," as they call it, to milk it, or perhaps be shorter than the others.

In the matter of not milking properly, more cows have their quarters injured than all the faults of careless milking combined. The majority of milkers bear down on the udder very heavily while milking. They pull and strain on the teats and quarters, and they imagine, because they are tugging and straining with their arms, that they are making great haste with the milking. In this way they strain the quarters, and cause them to leave their natural position in the udder, and the careless milking does the rest. The strain also, through the falling away of the quarters, ruptures the milk glands and brings on acute inflammation, and the milkers soon find that the cows are suffering with bad udders. It is sometimes put down to chills, or some other cause, by the milkers, whereas it is due solely to the milkers not knowing how to milk properly. The loss of quarters was almost unknown among cows in the early days of the industry, owing to their calves being reared by them; and the same careless method of milking seems to be still in vogue. The leaving of a pint or so to the cow made no difference, as the calf got the benefit of the milker's carelessness, and the cow was none the worse for it in the end. The same was the result of not properly milking, as any cow seriously injured had her calf left with her, and she was fattened and sold for the value of her hide and tallow. All those methods have changed, and the milking of a cow properly is a most im-

portant matter for the industry. In every profession there are various ways to do the work, but there is only one thoroughly competent way, and in this respect, milking is no exception to that well laid down rule.

The proper way to milk a cow is as follows:—The cow, being bailed up and leg-roped, and the udder well washed with cold water, the milker should take the bucket and stool, and go into the bail and set the stool so that he or she can sit down to milk at a slight angle with the udder of the cow, so as his or her right shoulder during the milking process will press very lightly against the side of the cow, at the arch towards the flank. When the milker is properly seated, the first thing is to moisten the teats well with a little of the milk drawn from each of the teats. The bucket should then be taken and placed between the knees, but not set on the ground, as is a very common practice with the majority of milkers. The bucket should be held firmly, though lightly, pressed between the knees, and the milker sit so as it will stand well under the cow, and perfectly upright, and not leaning on its side towards the cow, as is the style of many milkers. The milker should then take either the two front teats, or the two hind, but not a front and hind, as some milkers imagine to be a general rule. The teat should be held in the hand so that the little finger rests about one-eighth of an inch from the opening of the teat, which will allow the first finger to be well up in the udder. The near side teat should be taken in the left hand, and the off side in the right. The milking is done by gently pressing the teat with the first finger, and then with the second, third, and finally with the little finger. A slight pressure upwards, with each hand on the udder, and a gentle pressing of the two quarters together, with the regular rotary movement of the fingers is all that is needed to make the milk flow from the udder in a continuous stream.

When the two first teats taken begin to show signs of being drawn near a finish, full handed, the other two should

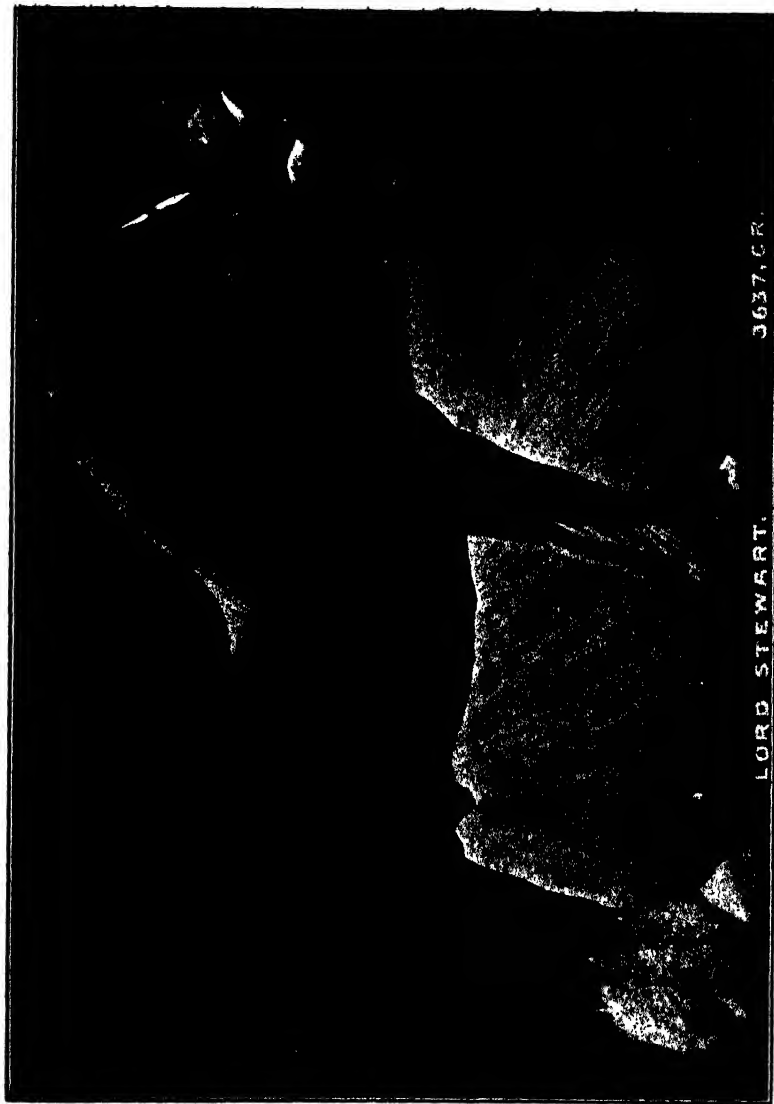
be begun, and milked in the same way. When those are finished, then the cow should be stripped thoroughly dry. To do this properly, the teat should be taken in the left hand, and the right hand put well upon the quarter and then drawn gently downwards with a light gentle pressure, so as to bring all the milk to the opening of the teat. When each of the teats is stripped dry, in this way, the cow should be left standing undisturbed in the bail, for five or even ten minutes, and then restripped, in order to obtain the best results, as some cows do not give their milk, especially the latter part, as freely as others, which is, in the majority of cases, solely due to the milkers. Cows should be always treated very kindly, and spoken to and handled gently and quietly, milked very quickly, and stripped thoroughly dry, and the improvement in both the quantity and quality of their milk will be more satisfactory in every way. Milkers have a very marked influence on cows, and this should be well borne in mind by all engaged in the industry. It is very easy to take the bucket, and sit down, and begin milking, but the obtaining of all the milk possible from the cow is quite another thing. In many cases, milkers get none of the milk from the cows, try how they will. In this is the true art of milking, to get all the milk possible from the cow each meal.

The general idea seems to be that the milk is in the cow's udder, and the only thing required is to transfer it from her udder to the milk pail, as if the udder was a mere can, or tank, to hold the milk in, and the teats were merely the pipes or taps that could by pressure be either turned on or off, at the will of the milker. This is a mistaken idea, as the udder is composed of most beautiful network of milk glands in each of its quarters, and these empty the milk into the central reservoir, of each quarter, through valves most delicately constructed. By the contraction of the muscles of these valves they become naturally closed, so as no milk can pass through, and the reservoir that supplies each teat is empty. Unless the cow relaxes the muscles of the valves, it is folly

to try to milk her, as is the general experience of milkers, when cows "hold up their milk," as it is termed. This is the reason why cows retain their milk, and why milkers should do everything possible to induce them to give it freely and generously. The requisite materials to naturally form the milk are all in the milk glands, and are continually undergoing the process of transformation into milk, and the stimulus given these glands during the process of milking causes the milk to move quickly from the raw material, and the quantity of milk is thereby slightly increased. There is a very sympathetic unison, or harmony, passing between a good milker and the cow, which is due largely to the gentle and soothing excitement, caused by the almost magnetic-like vibrations passing over the milk glands during the milking, for which the animal naturally looks forward, and well repays, by quickly giving down her milk in a free and contented manner, so pleasant for both. It will be found more profitable to let the cows stand a few minutes in the bails after washing their udders, before starting to milk them, as it gives the cow time to calm down, should she be in the least nervous, or easily excited. It will also be found best to have a person to do the bailing up and leg-roping, and washing of the udders for the milkers, as well as the unleg-roping and letting out after their being stripped, than for each milker to do the work for himself. Very little extra expense is required to put up a set of double bails, and the rapidity with which cows can be milked each meal would more than repay the outlay in a very short time. This rule of curtailing the expense in the matter of suitable and convenient buildings for milking has been a great loss to the industry. The time lost in bailing, leg-roping, and letting out by each milker, besides the rushing and exciting of the cows, is in every way a great loss to the industry.

Through this system of mismanagement it has been eagerly sought to employ machinery instead of hand labour for milking in large dairies, but up to the present the use of machinery has not

CLYDESDALE STALLION.



PROPERTY OF SEAHAM HARBOUR CO., DURHAM.

By the courtesy of Messrs. Wm Cooper and Nephews.

been a success, owing to its many disadvantages, not to mention the many defects it has to surmount. Inventors of this line of dairy machinery have devoted much time, labour, and money, to their ideals, and in some cases they have perfected the machine, as well as human skill and genius can; but despite all these efforts, none so far can claim to be a perfect success, as each of the appliances becomes in time more or less injurious to the cow in many ways. The ideal of all kinds of milking machines yet made is to work the appliance on the suction principle, as they all claim it to be more natural than hand work. This is all well in theory, as the calf is supposed to suck the mother, which, in reality, it does not. Were any person to carefully study the natural action of the calf on the cow's teat, they would find that hand-milking was the only thing similar to it in existence. The calf takes all the teat in the mouth; so does the milker in his hand. The calf has a strong pressure and continued motion of the lips, as far up in the udder as its

slackness will permit; so should the milker.

The idea of a strong suction being natural on the part of the calf is solely due to its natural action when sucking the finger, and raising the milk from the pail during the process of hand-feeding. In hand-feeding we should not forget that the calf is forced to feed itself unnaturally, whereas its natural method of feeding is for the milk, by certain pressure on the teat, and a barely perceptible suction, to flow freely down its throat. When the calf cannot obtain the milk freely from the teat, it naturally leaves it, and takes a fuller one, and so goes to each of the full ones, until all are equal. When it returns, it, like the milker, begins to strip the cow, not by suction, but by drawing its firmly compressed lips from as far up the udder as possible downwards towards the point of the teat, which is similar to the hand action of every properly trained milker, for the purpose of stripping the cow thoroughly dry.

Forestry for the Transvaal.

NATAL is as closely interested in what is done in the Transvaal in the formation of plantations that the following article by Mr. D. E. Hutchins, Consulting Forestry Officer for the Cape Government, which appeared in the "Rand Daily Mail," deserves perusal.

The proposal to spend £100,000 yearly in this work only gives emphasis to the necessity which exists for a vast and rapid extension of forestry, and as it is likely that a smaller sum will for years be considered all that the Transvaal can afford to spend, Natal should seize the opportunity of supplying, and of growing, what will apparently be the deficiency until the Transvaal rises to the occasion:

Timber is a necessity in a civilised country. Civilised man can no more do without timber than without air and water. It is not at all unlikely that the

Transvaal during the next few years will require half-a-million pounds' worth yearly of unmanufactured timber or lumber. Is this to be brought, 6,000 or 7,000 miles by sea from Australia or Europe? Obviously, if the economies of the matter are considered. No! If, however, we reflect that the Transvaal is not just now in surplus funds, and that money spent now on forestry will not give much of a return before 20 years, there will be a strong temptation to postpone this most necessary expenditure. But let us not forget that every year, nay every month now in which there is delay in beginning forestry plunges the country deeper into a wrong position. The Transvaal cannot, like England, afford to pay £20,000,000 yearly for imported timber, and write unctuous articles in the "Times" glorying in the volume of trade and the advantages of free trade. The

Transvaal forest possibilities can no more be allowed to lie idle than its mines. The Transvaal has a forest-producing power which is many times that of Europe, and every month that is lost in putting this forest-producing power into action, is a dead loss to the country. What is required at once is the demarcation of the forest reserves, that is to say, the areas which will form the future national forests of the country, and the setting aside of funds, say £100,000 yearly, to afforest those reserves.

AREA OF RESERVES.

The question at once arises what should be the area of the forest reserves. In the Universities of Europe where this question has received very careful study it is held that not less than 25 per cent. of the total area of a country should be under forest. Germany has this 25 per cent. Austria and Russia a little more; Switzerland and France rather less. Italy, owing to historical reasons, has had nearly all its forests destroyed.

The average importation of timber to Cape Colony is 5 million cubic feet. To provide double this quantity for the Transvaal on the basis of a 200 acrim would require 50,000 acres or 100,000 acres on the basis of an acrim of 100. Or as a thriftily populated country like Cape Colony, the Transvaal would require in forest reserves from 50,000 to 100,000 acres—as a thickly populated country on the European basis anything from this to one-fourth of its area. It is pleasant to think that Johannesburg is to have another beautiful and useful park, and that you are naming it after Lord Milner, who from the day he landed in South Africa has taken the keenest interest in its forestry. If I might offer a suggestion it would be to add a small forest aboretun to this new park on the lines of the forest aboretun at Tokai, near Capetown, or of that to be formed in the Matoppoos Park with the proceeds of the Rhodes bequest. Such a forest aboretun in Johannesburg would be very instructive. Lectures and book teach little forestry. It is the forest itself that is the powerful instructor.

SLEEPER BUSINESS.

South African railways, after a thorough trial of metal, have gone back to

wooden sleepers. The Cape railways, with a mileage of a little over 2,000 miles, require yearly about £100,000 worth of wooden sleepers. I can remember 12 or 15 years ago with what difficulty the Railway Department were induced to take a small supply of sleepers from Knysna. Political pressure was brought to bear, and then it was said that the sleepers were taken as an act of charity for poor Knysna woodcutters, though, as a fact, Knysna never got more than the market price for sleepers, which has been 5s. and 5s. 6d. In spite of the experience of English railways, which I vainly urged upon the notice of the authorities, they would then use nothing but metal sleepers. Now has come a reaction; first the pot sleeper failed and then the trough sleepers. When I pointed out that they would rust in the ground, I was called a timber enthusiast, and a member in the Cape Parliament made the remark about the "cobbler sticking to his last."

It is estimated that on a basis of 2,100 miles of railway open (in 1901) 2,000 sleepers, per mile and ten years' life, the U.G.R. want now yearly, say, one million cubic feet yearly. To produce this million cubic feet plantations are being laid down thus:—

3,500 acres eucalyptus with a 200 acrim — 700,000. 3,000 acres pines, with a 100 acrim — 300,000; total, 1,000,000.

WILL FORESTRY PAY?

There is little doubt that private plantations of quickly-growing trees will pay handsomely for such employments as pit-props, where immature timber or coppice poles can be used.

The exact profit that is realisable on such plantations will depend naturally on the cost of planting and the trees planted. When an average of £40 per acre has been expended, as was the case in one large series of plantations at Johannesburg, and when all sorts of trees have been planted, there is room for such a plantation to yield little or no profit. Another large series of plantations has cost under £20 per acre. As long as timber can be cut at ten or fifteen years, the risk of failure is greatly diminished. Timber for houses, bridge building, and general use must be mature, and very little timber of this class is mature before 40 or 50 years.

SOME FIGURES.

On a 200 acre yield increment, and supposing the wood to be worth 6d. per cubic foot as it stands in the forest, and to be cut at 50 years of age, we have a return of 200 x 6 x 50 equals £250, or a profit of, say, £400. This is stating the matter broadly, and using only moderate and safe figures. With the growth of trees in the Transvaal 200 cubic feet seems quite a safe average acre increment, assuming, of course, that the species and sites of the plantation are well chosen. No doubt there will be portions of such plantations where one will be able to measure an acrim of 700 cubic feet, but as a mean figure it will be safe to take under a third of this. Sixpence

per foot as the average price for wood in the forest is far too low a figure on the basis of the present price of timber. Blue gum mining props are to-day worth 1s. 6d per cubic foot as they stand in the plantations at Johannesburg, but it must be remembered that the *raison d'être* of the National Forestry in the Transvaal is to render to the people timber at a cheap rate. If there be any delay in demarcating the forest reserves, resulting in their being afterwards badly placed, the result will be a lowering of the value of the timber in the forest, and also, it may be feared, a lowering of the growth. So that the prospect of very remunerative forestry in the Transvaal is largely dependent on utilising the present opportunity of land settlement.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of February, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same per. from July 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	85.1	67.8	92.9	63.6	2.40	13	.98	6th	22.89	33.96
Stanger... ..	87.7	69.1	97.0	59.0	3.92	16	1.01	22nd	26.86	31.66
Verulam	88.9	68.2	97.0	62.0	1.50	14	.56	10th	22.29	28.53
Greytown ... ..	...	...	...	...	4.59	11	1.86	5th	...	...
Newcastle	91.5	67.5	96	59	2.16	11	.90	5th	15.75	26.70
Eastcourt	87.6	60.1	97	54	3.55	9	2.00	14th	19.48	24.33
Ndwedwe	81.6	60.8	97	56	2.56	14	.60	11th	...	...
Port Shepstone	88.2	58.7	94	49	2.12	8	.84	9th	...	39.90
Umsinto	85.8	55.0	92.5	52	1.71	3	1.45	28th	29.17	28.55
Richmond	83.6	59.2	99	54	2.75	14	.52	26th	20.35	30.98
Maritzburg	86.3	58.2	102	50	2.55	15	.68	5th	16.18	24.33
Hilton Road	79.7	57.7	93	50	4.10	17	1.65	5th	...	...
Howick... ..	86.9	57.8	97	50	2.48	18	.85	6th	14.50	24.27
Ladysmith	94.0	61.8	104	50	1.82	11	.73	5th	10.40	...
Dundee... ..	91.4	52.7	95	50	1.74	4	1.18	17th	16.26	26.34
Weenen	92.9	63.0	103	54	3.33	13	1.23	28th	18.36	20.13
New Hanover	87.4	60.5	103	56	4.49	14	2.17	5th	18.82	...
Mapumulo	85.8	53.6	104	44	3.85	8	1.51	11th	23.62	...
Nongoma	80.0	61.8	89	57	3.60	8	1.00	5th	...	30.81
N'Kandha	77.5	48.6	92	39	1.67	7	1.00	6th	...	...
Qudeni	75.3	53.4	87	47	5.89	22	2.17	6th	31.61	44.30
Umlalazi	90.1	...	103	...	2.21	7	1.05	10th	...	...
Elabisa	85.1	69.0	95	65	3.45	5	1.30	7th	...	29.10
Melmoth	83.9	61.5	100	56	1.90	13	.52	6th	18.40	24.18
Eahowe... ..	81.9	63.9	94	59	3.44	12	1.03	11th	30.16	41.81
Point ... ..	...	...	...	...	3.07	12	.93	10th	...	21.70
Paulpietersburg	83.9	...	94	...	1.51	15	.45	27th	...	...
Nqutu	78.5	46.7	87	39	4.76	14	1.54	10th	16.84	...
Mahlabatini	86.6	63.5	95	56	2.04	8	.90	5th	...	...
Lower Tugela... ..	87.6	66.7	106	60	2.56	11	.86	23rd	20.98	...
S. C. Junction ... ..	..	...	...	...	1.48	7	.61	23rd	19.95	34.19

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	N. Grant ... P. G. Boshoff ...	Brakfontein. Smaldeal.
J. Button ..	Estcourt, South of Bushman's River	Lungsickness	D. W. Mackay ... R. R. Wright	Dalton. The Alps.
J. J. Hodson ...	Lion's River ...	Scab	J. King ... O. Strapp ... J. & E. Parker ... E. Parkinson ... H. W. Wardale ... G. & B. Hutchinson P. D. Kimber	Lynedoch. Oatlands. Tetworth. Klipfontein Beverley. Boschfontein. Maritzdaal.
K. Soutar ...	Portion of Lion's River	"	F. Stanley ...	Nonpariel.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	J. Thring ...	Mayfield.
A. H. Ball ...	Weenen ...	Scab	J. P. Lotter ... T. Hair ... H. J. Vandermerwe	Berg Vleit. Gretna Green. Exchange.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
E. J. B. Hosking...	Upper Umkomanzi	"	W. W. Johnson ...	Oottingham.
A. S. Parkinson ...	New Hanover ...	"	Makenke & others Bongola & others }	Swazimana's Location.
C. J. Van Rooyen	Krantzkop ...	"	H. T. Van Rooyen Mrs. Nel ... J. P. Nel ...	Krantzkop. Ungegunt. Sweet Home.
B. J. Raw ...	Impendhle ...	"	J. B. Griffin ... A. Speirs ... W. M. Fisher ...	Kimberley. Mount Park. Myrtle Grove.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 34 herds of cattle under license for Lungsickness, and 10 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	3 for Lungsickness, — for Scab
Klip River	...	...	...	6 3
Dundee	...	...	...	2 3
Umsinga	...	...	...	8 2
Upper Tugela (North of Tugela River) Division	...	...	...	— 2
Utrecht District	...	...	...	1 —
Vryheid	...	...	...	5 —
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	...	2 —
Nkandhla and Ngutu Districts...	...	...	...	5 —
North of White Umfolosi and Umfolosi Rivers	...	...	...	7 —
Total	...	...	...	34 10

The following farms are in quarantine for rinderpest :—

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolozi District, Nquta District, Nkandhla District, Ndwandwe District, Nongomo District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 1st April, 1903.

Instruction In Judging Cattle.

SCORE CARDS.

MESSRS. K. J. Mackenzie and T. R. Robinson, of the Wye Agricultural College, Kent, write to the *Agricultural Gazette* (England) :—We take it we shall not trespass on any preconceived tradition if we state it is a difficult thing to train the young agriculturalist.

The syllabus at an educational establishment has a vast range that may be conveniently divided into scientific and purely technical sides. While many of the scientific subjects form a conglomerate difficult to arrange and convey with distinction to a student, technique requires a very considerable amount of teaching. There has been in the past an inclination towards empirical rather than systematic methods in farming, which in good times was well enough. There is no doubt that a comfortable balance at the bank does decrease the paternal anxiety. In days when wheat was 50s. or more a quarter, a farmer was quite content that experience and love should enable his son to leisurely take up the burden of this profitable business. Now things are different. Both agricultural colleges and students are increasing in number. Men require to be taught not only thoroughly but quickly. No one will, we believe, gainsay that possibly among the many difficulties to be overcome, that of indicating a knowledge of live stock is perhaps the most subtle. Some years spent in instructing a considerable number of students in Agriculture throughout their two years' course had brought this difficulty most vividly before our late colleague and vice-principal, Mr. F. B. Smith. We were therefore not a little impressed with the strong opinions he set forth in his report to the Governors of the S.E. College, on returning home from the United States and Canada.

Writing on this subject Mr. Smith says, "Students are provided with score cards and judge the animals with their help.

As they advance the card is dispensed with, but they still give definite reasons for their decisions." Many instances are given to show the advantages of live stock judging by this means. We are, therefore, not ashamed to offer our cousins on the other side a sincere form of flattery, and find that the behaviour of English students corroborates Mr. Smith's views. We are quite aware that, particularly in the case of Shorthorns, there is manifestly a great difficulty in arranging a scale of points that could be accepted by all as a "standard of excellence." The Scotch type, the dairy type, and some of the beautiful Bates cattle we used to see years ago, present very different characteristics when compared one with another. What is best, and what is worth most money to a foreign buyer may be something very different to look at, compared to the general purpose or milking Shorthorn required by the West Countryman. While fully acknowledging these facts, the point remains that there are a good many shows in this country with classes for "Shorthorns." The type is not specified, and it rests with the opinion of the judge to award the prizes to the best of his ability. The novice naturally asks, why is this animal better than that? Our score card is open to criticism. Our own innovation is, we know full well, but a preliminary trial. We venture to think, though, that novices will greatly increase their knowledge, improve their powers of observation, and increase their experience more rapidly, if they but follow the somewhat tedious process in constantly practising themselves in the use of these judging forms. The "born judge" may scoff. The man with "an eye" may know by instinct. The aspirant to knowledge, however, says, "We know little, help us to learn." To them we recommend a system which, in practice, merely means examine a beast point by point, from head to tail. Value

such points as you go along. Transmit your judgment to paper, and let it be criticised by one who has more knowledge and experience than yourself. This we believe to be a sure way of conveying the knowledge of the instructor to the one who is seeking for that knowledge.

SOUTH-EASTERN AGRICULTURAL COLLEGE,
WYE, KENT.

SHORTHORN COW SCORE CARD.

Name of Animal
Weight and Age

	Max. Points	Student's Estimate.	Instructor's Estimate.
GENERAL APPEARANCE:			
In moving head, slightly raised or level. Easy walk, short legs free from sweeping	5	.....	.....
Form, well bred and feminine, with even top and under lines, the under line swelling as cow ages	10	.....	.....
Quality, skin soft and mellow, very flexible, and covered with mossy hair in combination	10	.....	.....
Temperament, quiet. Colour red, white, or roan, or in combination ..	.....	.....	.....
HEAD AND NECK:			
Forehead, broad, slightly dished ..	2	.....	.....
Horns, short, or of moderate length, rather flat at the roots, turning inwards, buff or light flesh colour, yellow in the helter	2	.....	.....
Face, moderate length, cheeks not too fleshy	1	.....	.....
Eyes, bright, prominent and placid ..	1	.....	.....
Nose, large, with high nostrils, the whole light flesh colour (black or smutty nose objectionable)	2	.....	.....
Ears, medium size, well fringed with hair	2	.....	.....
Neck, medium length, and spreading well out to meet the shoulders (the ewe neck objectionable)	5	.....	.....
BODY:			
Back, straight from withers to setting on of tail	4	.....	.....
Ribs, well sprung	4	.....	.....
Loins, wide and well covered, not narrowing down to ribs	4	.....	.....
Chest, large girth, with no falling away behind shoulders	3	.....	.....
FORE QUARTERS:			
Shoulders, sloping, and well filled behind, shoulder blades free to open for growth	6	.....	.....
Brieket, deep, and moderately projecting; fore-arms thick	4	.....	.....
HIND QUARTERS:			
Hips, wide apart, with plenty of space between hips and root of tail	4	.....	.....
Pin bones, wide apart	4	.....	.....
Tail, squarely set on and of good length	3	.....	.....
Thighs, long and escutcheon spreading over thighs, and extending high and wide	4	.....	.....
UDDER:			
Extending well forward and full behind. Four teats squarely set on. Milk veins about udder and abdomen prominent. The whole udder showing plenty of fine substance, but not fleshy	30	.....	.....
Total	100	.....	.....

Date.....

Signed.....

Agricultural Shows.

Himeville, Friday, 3rd April. Entries close 16th March; late entries 2nd April. Henry O. Gold, Hon. Secretary.

Greytown, Thursday, 14th May. Entries close 25th April. President, A. Kohrs. W. H. Gibbs, Hon. Secretary.

Ixopo, Thursday, May 21st, 1903. Entries close with Hon. Secretary on Saturday, May 9th. Fred. Thompson, Hon. Secretary.

Bulwer, Thursday, 28th May. Entries close 9th May. President, J. F. Alexander. Hon. Secretary, A. Brown.

Estcourt, 3rd and 4th June, 1903. President, H. Blaker, J.P. E. Catherley, Hon. Secretary.

Umsinto, Thursday, 18th June. Entries close 13th June. Hon. Acting Secretary, R. G. Archibald.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries (to be made to Messrs. Duff & Eadie, Assistant Secretaries, 19, Timber Street) close 4th June; late entries 11th June. President, Sir T. K. Murray, K.O.M.G. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President, A. W. Cooper, J.P. Hon. Secretary, John Marwick.

New Hanover, Friday, 31st July. T. B. Train, Secretary.

Mid-Illovo, Thursday, 5th August. Entries close 15th July; late entries 20th July. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 24th June. Secretary, W. E. Allsopp.

The first Danish co-operative dairy was formed in Jutland in 1882, and now the dairies number 1,040 producing milk to the annual value of £7,112,000.

Dr. Morris, who is exerting his energies so laudably in the promotion of applied botany in the West Indies, points out in the *Agricultural News* (Barbados) that in the days when sugar-growing was very profitable, everything was sacrificed to make way for the planting of sugar-canes. Then sugar sold for £20, or even £30 a ton; now it is only worth as many dollars; nevertheless, enormous amounts of food-stuffs and other articles are imported, a great part of which could and should be produced locally. The high value of molasses as a feeding-stuff for horses is pointed out, and yet molasses are sold at very low rates in the Islands whilst thousands of bushels of high-priced oats and corns are annually imported from the United States.

Ensilage Extraordinary.

AT the Cootamundra Show some fine samples of silage were exhibited by Mr. P. J. O'Donnell. I made some enquiries about this exhibit, and found that Mr. O'Donnell has an enormous quantity of ensilage on his station at Mingay, which has served him all through the drought, and saved thousands of pounds that would otherwise have gone in purchasing food for starving stock. He stored the stuff some three or four years ago, when there was a great surplus of grass about the place. No special pains were taken to make ensilage, according to scientific rules, as regards weighting and regulating of the temperature. The grass was simply cut with a mowing machine, and carted into a heap, and a very irregular one it was when it was finished. Thousands of tons were put together, however, and it was raining nearly all the time the work was in progress. No weights were put on, but the stack or heap no doubt got a good deal of trampling by the teams in the process of building. In the course of

time it settled down into a black mass, like a dung-heap, and for years it lay in that condition. It was once under flood, and on another occasion a bush fire went over it. The drought ultimately led to an investigation of this manure pile, so-called, which was apparently worthless, after being besieged with fire and water, and it proved to be ensilage in a splendid state of preservation. The owner of Mingay now cuts it out with a spade, and all the stock on the place have been fed on it for months past, and are in fine condition. Mr. O'Donnell says it is the cheapest and best fodder anyone could wish for in a drought, either for sheep, cattle, or horses, and that it will keep as long as you like. He considers that by cutting and stacking the surplus grass in good seasons, the drought problem would be solved to a great extent in this State, and that wholesale losses of stock might be entirely averted were a supply of ensilage provided on every farm and station in the country.—*Australasian*.

Preserving Books in the Tropics.

THE books should be lightly painted over by means of a camel's-hair brush, both outside and inside the covers (and especially along the margins and backs where paste has been used), with a mixture as follows:—

- 1 oz. Corrosive sublimate.
- 1 oz. Carbolic acid.
- 2 pints methylated or white rum spirit.

This solution (if carefully applied) will effectually preserve books with either paper, cloth or leather covers

from cockroaches and other insects. No varnish will be done to the books, and after the mixture has dried they may be handled with perfect safety.

Every new book received should be at once treated in this manner. The result will be that they will keep in as good order in the tropics as in temperate climates.

Bookbinders in the tropics are recommended to use a paste poisoned by adding half an ounce of conner sulphate (or blue stone) to every pound of paste.—*Agricultural News, Jamaica*.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—That produce will be at famine prices during the next twelve months has now become an absolute certainty. Not only in Natal, but all through South Africa the same reports reach us; and, to-day, reliable informa-

tion has arrived that the Orange River Colony crops, which at one time bid fair to be about the average, have been destroyed by frost. On Monday, the 30th, heavy hail was experienced within a few miles of the City. The colony will have to depend on importation. The farmers

in many districts have realised this fact, and are, in conjunction with merchants, trying to induce the Government to suspend the duty on imported grain. This may in a great measure help to tide over the difficulty, but the prospect for agricultural farmers, both black and white, is far from assuring. What black farmers will do is hard to say.

Mealies.—We are now absolutely dependent on imported grain; and, owing to old stock running low, prices in Durban have risen considerably during the past fortnight.

Forage.—There have been some good samples sold during the past fortnight, and prices have fluctuated between 6/1 and 10/6 per 100lbs.

Hay.—Some fair samples offered, but the average is very poor; prices have ranged between 2/6 and 5/6 per 100lbs.; bedding from 30/- to 35/6 per load.

Potatoes.—Fair quantity offering, and prices are as low as 6/6 and 8/-, and up to 11/-, 12/6, and 13/8 per 100lbs.; sweet potatoes from 4/6 to 5/3 per 100lbs.

Mabele.—A few small lots offered, which realised from 17/3 to 17/6 per 100lbs.

Pumpkins.—From 5/9 to 8/- per dozen

Lucerne.—From 3/3 to 4/- per 100lbs.

Poultry.—Common fowls from 1/6 to 5/1 each; ducks from 3/9 to 9/9 per pair; turkeys (cocks) 15/6 to 19/- each (hens) 7/3 to 9/3 each.

Onions.—From 9/- to 16/9 per 100 lbs.

Eggs.—From 2/9 to 4/8 per dozen.

Sundries.—Mutton 5d. to 9½d. per lb.; pork 4½d. to 9d. per lb.; cheeses 2/6 each; sucking pigs 4/- to 6/6 each; pigeons 9d to 2/- per brace.

Vegetables.—Beans, beetroot, bringalls, cabbages, carrots, celery, chillies, eschalots, lettuce, peas, rhubarb and tomatoes.

Fruit.—Apples, bananas, grenadillas, guavas, grapes, limes, Avocado pears, oranges, peaches, pomegranates, pineapples. A quantity of Cape fruit has also been disposed of.

Firewood from 6d. to 1½d. per 100lb. Quantities of household coal have also been disposed of.

DURBAN.—Mr. W. H. Edmonds, Box 44, reports:—

General.—Business keeps very quiet.

Mealies.—Practically none are to be had, either Colonial or imported. The inquiry is enormous, and, as usual in Natal, we shall probably see a glutted market later, on with the inevitable heavy losses consequently incurred.

Potatoes.—The market is strong, and good samples bring 17s. per muid.

Forage.—This is in good supply at about 10s. 6d. per 100lbs.

Hay is coming in more freely, and is still fetching high prices, which being entirely fictitious need not be quoted, as any day may see a big drop.

Mabele.—The market is quite bare, and any early lots would bring fancy prices.

JOHANNESBURG. Mr. W. H. Thomas writes:—The market has changed for the better since I wrote last. The main feature has been forage, which touched 13/6 several times, and to all appearances will remain firm now for some time—until we get the O.R.C. crops in. Red mabele is also in demand; good mealies also.

Some Basutoland mealies are coming in now, but are in very bad condition, being too old. Lucerne remains firm at 12/- to 12/6 per bale; this is for imported. Potatoes have gone back again, though they touched 30/- for exceptionally good samples. The prices are as follows:—
Seed Barley.—Per 168lbs. Poor samples have been offered and sold at 17/6 to 19/6, and better, 21/- to 22/-.

Green Barley for Forage.—Per 100 bundles. Some better stuff has been offered and realised from 30/- to 50/-.

Bedding.—Per load, according to size of cart or trolley, from 8/- to 40/-.

Bran.—There has been an exceptional run on this line; it sells from 11/- to 11/9 per 100lb. bags.

Butter.—Fresh, from 1/- to 1/3 per lb.

Bales of Chaff.—Per 100lbs.; selling this week from 7/- to 8/6; some inferior has been offered and realised 3/- to 4/-.

Kafir Corn.—Per 200lb. bags. Red mabele in demand and sold at 30/- to 31/9; white, 28/- to 30/-; Mozambique, 16/- to 17/6 per 198lbs.

Oathay.—Per 100lbs. This is in strong demand now, and some very decent parcels and qualities have been sold this week, realising from 11/6 to 12/6, although 13/- and 13/6 was touched.

Onions.—Per 125lb. bags. The market was well supplied with this line, being sold from 7/- to 10/- and 12/- to 15/-.

Potatoes.—The market still continues to be slumpy, although some good samples realised as much as 30/- for 163lb. bags, the middle prices being now 21/- to 26/-; medium 15/-, 20/-; inferior 2/6 to 12/-.

Fowls 3/- to 5/-; **Ducks** 5/- to 7/-; **Geese** 7/6 to 10/-; **Turkey hens** 8/- to 12/-; **Cocks** 15/- to 20/-; **Fresh (local) eggs** 5/- to 6/- per dozen; **imported eggs** 1/6 to 3/- per dozen; **Natal tobacco** in leaf 2d. to 2½d.; **Transvaal** 1/6; **Cape tobacco** in rolls 3d. to 7d. (not the best quality).

J. Raw & Co.'s Sales.—At Nottingham Road, on Wednesday, the 18th March, Messrs. J. Raw & Co. conducted a sale of Stock, under the auspices of the Nottingham Road Farmers' Association, when the following prices were realised:—**Wethers** 21/6, 21/-, 28/-, 30/3, 23/-, 26/9, 23/6; **Ewes** 23/9, 18/6, 25/6, 20/6, 12/-, 24/-; **Wethers** 25/9; **Rams** 65/-, 63/-, 62/6, 15/-, 45/-, 27/-, 20/-, 50/-, 60/-; **Heifers** £14 10/-, £15 10/-, £12 15/-, £10, £11 11/-; **Young Oxen** £10 5/-, £7, £10, £10 10/-, £9, £13 5/-, £14, £15, £13, £11, £10 10/-, £8, £7; **Cows and Calves** £16 10/-, £18, £15, £10; **Oxen** £17, £17 10/-, £15 10/-, £11 10/-, £10, £18, £13, £12 5/-; **Bulls** £8; **Young Bulls** £7; **Pigs** 13/-; **Mares** 5½ gns.; **Geldings** 28½ gns., 5 gns., 4½ gns.

Another Rami fibre boom is predicted as a result of the invention of the "Faure" decorticator described as a strong and cheap machine suitable for hard work on plantations, and working economically and effectively. The Rami Congress held in Paris last year passed it as being all that is required. A large demand is expected for decorticated fibre, and the cultivation of the plant is advised. The American and French Governments are pressing its cultivation hard. So writes Mr. H. A. Carter, of Manchester, to *Capital*.

The Agricultural Journal

AND MINING RECORD.

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Central Experiment Farm.

VISIT BY DELEGATES TO FARMERS' CONFERENCE.

ON the 8th inst. the delegates to the Farmers' Conference, at the invitation of the Minister of Agriculture (the Hon. H. D. Winter), visited the Central Experiment Farm. The delegates, under the guidance of the Director of Agriculture, inspected the farm generally and the various experimental plots.

At one o'clock the company re-assembled at the refreshment tent, where a cold collation was provided.

The Minister for Agriculture presided, and after the loyal toast, proposed that of "Success to the Natal Farmers' Association." He attributed the establishment of the farm to Mr. Leonard Acutt and other members of the Conference; and, proceeding, admitted that the organisation had been of great assistance to Government. But he would like them to indulge a little less in politics and apply themselves more to the im-

mediate interests of the agricultural community. (Laughter.) He congratulated them upon the appointment of Mr. Alexander as president, in making which appointment they had shown a sound judgment. He welcomed the farmers to the Experimental Farm, and hoped it would not be their last visit.

The toast was cordially drunk by the delegates and others.

Mr. Alexander replied.

Captain Montgomery proposed the health of the Minister of Agriculture.

The toast was celebrated with musical honours.

The Minister, in responding, expressed the hope that the farm would be an institution to which they could send their children in the future for an agricultural training instead of sending them to other colonies. The farm was virgin soil eleven months ago, and what they had seen had been done since last September. He hoped that next year they would see motor ploughs at work, for it was the intention of the Department to furnish the farm with the most

modern appliances. But they must also understand that it was going to cost money. They had asked for an experimental farm, and he hoped that later on they would not complain that it was expensive. Mr. Winter also stated that had it not been for the war it would have been established years ago.

Mr. Alexander submitted the healths of the Department of Agriculture.

The Director of Agriculture replied. He said they intended to have paddocks where natural grass would be cultivated, and some 300 species of grasses would be tried from all parts of the world. They were also going to experiment with a large number of forage crops and they were ransacking the world in order to find out the varieties that would be specially suitable for Natal. The manager of the farm (Mr. A. Reid), the Entomologist, the Dairy Expert, and the Conservator of Forests (Mr. T. R. Sim) also responded.

The temporary forest nursery was subsequently inspected. The party returned to the City by a goods train.

Prizes for Tree Culture.

AT the Farmers' Conference the chairman read a letter from Mr. Maurice S. Evans, C.M.G., in which he offered inducements to those occupying the land in the Colony to grow trees. He was persuaded that for many reasons it was desirable that the growing of trees on proper lines should be taken up by Government and farmers. He offered a money prize of £50 to each of the electoral divisions of the Colony, with the exception of Alfred, Alexandra, Eshowe, and Melmoth, for plantations of trees planted in the years 1904 and 1905. To the four divisions mentioned the prizes would be of £25. In each case the prize must be divided into three. For the purposes of the competition, 10 acres at least must be planted, and additional area up to 50 acres would be counted for

points. Judging would be done in 1910. Blue gums, black and silver wattles, and pinus insignis were debarred from competition. Should the experiment show signs that it was likely to attain the object desired, Mr. Evans would be glad to extend it to the new territory as soon as the people there were ready to entertain the new project. In conclusion, Mr. Evans stated that he did not want a monopoly in this matter, and should the Conference or any agricultural society wish to give additional prizes, he would be glad of such practical sympathy.

After consideration it was decided that in connection with an appeal to Government for supplementary assistance, the subject be referred to the various farmers' associations for their opinion on the matter.

Paspalum Dilatatum.

MR. W. L'ESTRANGE received the following report on *Paspalum Dilatatum* with some seed which he has imported, and kindly sends it for publication in the *Journal* :—

PASPALUM DILATATUM.

THE GREAT PASTURE GRASS.

The first introduction of this famous fodder grass is acknowledged by the Richmond River farmers to be due to the late Baron Von Mueller, who described it as indigenous to Ceylon, and strongly urged it upon the notice of Australians on account of its high nutritious qualities and its drought-resisting properties, on which he laid great stress.

Mr. Edwin Seccombe, an early Richmond River settler, then experimented with it, and proved it to be good ; but it was not until Mr. H. Morton Williams, of Wollongbar, took the matter up, and gave the grass a practical trial, that its real value was demonstrated.

WHAT MR. WILLIAMS SAYS ABOUT IT.

"I have found that when *paspalum* is sown with other grasses the pasture will carry a beat to the acre all the year round. From January until May last portions of my land carried nearly three cows to the acre. *Paspalum* grows vigorously during the fierce heat of summer, when all other grasses are burnt up. It will grow tall and tussocky if planted wide apart, and if not eaten down, but the fodder is not coarse or wiry, but succulent in every part from the stem to the seed head. It makes excellent hay, and yields enormous crops. It stands any amount of grazing, and the trampling of stock does not injure it. Stock will eat every part of the plant, even the strong growth ; sheep thrive on it, and all fodder-fed animals are fond of it. It keeps cows in such condition as to enable them to give a high standard quality of milk. My paddocks sown four years ago, and regularly eaten down, are still improving. Sown with prairie grass, rye grass, cocksfoot, and clover, it makes a splendid sward. I consider it is the best grass for

dairy farmers to rely upon for permanent pastures. It will spread rapidly if allowed to seed, but it does not do so from the root. Frosts will not kill it. Floods will not injure it, even if it is under water for a week. It roots deeply, and will tap any sub-soil moisture. It prefers a warm, humid climate, but with a moist sub-soil this is not essential. It has, however, great drought-resisting qualities. It does not mat on the ground, and all other grasses come through it."

HOW TO SOW AND PLANT.

Plant out the roots whenever the weather is favourable, with a spade, driving it into the ground with the foot, and pressing it forward, then place the plant in the open space behind, and firm the soil with the foot. The plants should stand 5 feet apart each way, and 1,750 plants will be sufficient for an acre ; a man and boy should plant 1 to 1½ acres per day. Sow other grasses named between the plants, to make a change of food for stock, and a thick sward, at the rate of 20 to 30 lbs. per acre ; after the paddock has been grazed, allow the *Paspalum* to seed naturally and scatter its seed ; the stock will then trample the seed in and spread it ; this is the best method of obtaining a good sole of the grass. *Paspalum* seed, however, can be sown broadcast with other grasses at the rate of 2 lbs. per acre, and 40 lbs. mixed grasses will seed an acre. The best time to sow is during spring or early summer.

The best authorities on trees state that the English oak may live to the age of 1,500 years, only cedars, sequoia, and baobab having a still longer life. Poplars reach only 50, elms 335, maples 516, birches 576, oranges 620, cypresses, walnuts, and olives 800, planes 1,000, and limes 1,100 years.

The production of apple trees in the commercial areas of the United States of America has during the last decade increased at a rapid rate. There were on June 1, 1900, 210,000,000 trees in bearing, or an increase of upwards of 40 per cent. over the apple area of ten years previously. In what is called the Ben Davis-Winesap section of the country there are to-day nearly twice as many trees as in the famous Baldwin-Northern Spy region.

District Reports.

EMPANDHLENI, 31st March, 1903.—The weather has been cold and pleasant throughout the month, and has every appearance of a very severe winter. The total rainfall was 94 inches; maximum temperature, 89 degrees; and the minimum temperature, 34 degrees. What crops there are, are ripening, but already the Natives are complaining of the scarcity of food. The outlook is exceptionally bad, and at the present time there is scarcely any grain in the District at all. It is to be hoped that mealies will be imported, and without delay. Mr. G. M. Gunderson began the work of poisoning the hopper locusts on the 23rd inst. The hoppers are in such bad country and far apart that the work has to be done with great difficulty and it is hard to get the Natives to help. There have been no fresh cases of Lung sickness. Rinderpest, on the whole, is a great deal better. The disease is still bad in the Ward of Ndube, but this is certainly due to the fact that it is almost impossible to get the Natives to inoculate. During the month Mr. T. W. Cooper, Inoculator, informs me that 103 head of cattle have died. A horse, the property of Tom Findlay, died here on the 13th inst. from horsesickness. This horse had been down in the Mfongosi Valley, where it must have contracted the disease. On the 7th inst., three head of cattle and five sheep were killed by lightning in the Tufeni kraal of the Chief Siyunquza.

C. C. FOXON, Magistrate.

HARDING, 6th April.—The cry of no rain seems to be very general, but this District has in parts been more favoured than others; towards the Umzimkulu, Natives report that crops are very poor. There have been no cases of horsesickness that I have heard of as yet, but several of bilious fever. Mange among horses seems also to have died a natural death. I notice in your issue of 3rd instant, a letter speaking of using the long yoke for scuffling with oxen, and remarking on its awkwardness in turning. A farmer told me that he had seen two scufflers used at once behind a pair of oxen. A forked branch was used and the scufflers were attached to each end of the fork, this being of the necessary width to keep each scuffler in its place, by this means the ordinary short yoke can be used, the scufflers passing on either side of the row of mealies, and the oxen doing the same, this would be a great saving of labour, as double the work could be done by one more boy.

P. W. SHEPSTONE, Magistrate.

LOWER UMFOLOSI, 3rd April.—The weather during the past months was decidedly warm. The temperature in the shade registered 100° on the 23rd, and between 90 and 100° on several other occasions. Rain fell on seven days out of the thirty-one; the two heaviest falls being on the 2nd and 7th. Stock suffered considerably from the ravages of rinderpest. Two hundred and sixty-nine head of cattle were reported inoculated, and one hundred and eighty-seven head as having died from the pest. Further deaths reported among stock

were one newly-born calf killed by an overloaded stomach of curdled milk, and two goats eaten by aligators at the Mhlatusi river. Locusts were in evidence on the 14th, going south into Mlalazi District before a strong north wind, and were driven north again by a high southerly wind on the 15th and 16th. It is long since such a terrible spell of high winds has been experienced in this District as during the past twelve months, and it is thought the absence of locusts is attributable to such an unusual occurrence. Natives took advantage of the several rainfalls alluded to above to plant sweet potatoes, and, I am told, will continue to do so right into the winter, with a view to warding off famine as much as possible. They do not, they say, however, care to risk planting any mealies owing to the winter being so near at hand. Carob bean-tree seedlings are, so far, doing well, though very small yet. Grass fires again did some damage, Surveyor Alterm losing a tent, and his Native employees most of their effects through one; another burnt two store-huts in a Native kraal a few miles south of the Magistracy.

A. R. R. TURNBULL, Magistrate.

UMZINTO, 1st April.—There are very few locusts in the Division, and the locust officers have done good work. The mealie crop promises to be a good one, as the mealies are looking exceptionally well, which is a contrast to the Ixopo Division. Several horses have died in this vicinity during the last fortnight. About 855 Natives have been dealt with for taking part in the recent disturbances, and the amounts actually paid in fines exceeds £2,400. Great difficulty has been experienced in getting Ogle's people before the Court, and that half-caste Chief has given no assistance; in fact his conduct has been more defiant than otherwise. The local troop of B.M.R.'s are preparing for the annual encampment, and several recruits have joined.

F. E. FOXON,
Acting Resident Magistrate.

MAPUMULO, April 13th.—Since my last report I have made a personal inspection of the various parts of this district with a view towards procuring information as to the condition of the Native crops, and as a result I have been enabled to furnish an exhaustive report thereon to the Government. It is pitiful to see the shocking state of things existent everywhere as to failure of crops. The "aphis" has wholly robbed the Natives of all their amabele, while the continual drought in the Thorns has resulted in a nil return of mealies. The sweet potatoes are only now being planted, and it will be several months before they can be used. It is only by a personal inspection that any idea can be formed of the sad state the country has entered. Natives are realising the stern necessity of turning out to work, and during the month of March as many as 941 Natives took out passes under Act 49 of 1901, which is a record. Mealies have risen in prices at some stores to £2 15s. per muid of 205 lbs.

Although food is at famine prices, and, presumably, money scarce among the Natives it is seldom that they fail to pay fines inflicted by the law courts; in a faction fighting case lately heard before the Native High Court, at Stanger, fines were paid amounting to nearly £1,000,

which would rather contradict the theory of ready cash being conspicuous by its absence, at any rate in the adjoining Division.

GUY V. ESSERY,
Acting Magistrate.

Pound Notices.

THE following stock, unless previously released, will be sold on the 20th May next:—

Utrecht.—Black ox, branded with heart on shoulder.

Highbury.—Black yearling ox, little white on brisket, no brands; black-and-white yearling ox, white underneath belly, and four white legs, no brands

Moss Dale.—Bay mare, left hind foot white, branded on left hip indistinct; bay mare, Government cast brand on left hip, branded on right hip, looks like Ξ ; black mare, small white star, left hind foot white, with Spring colt foal, no brands; large black ox, forehead white, spotted white belly and legs, short tail, lame in front right leg, no brands.

Running on the farm "Almens Hoek."—Light brown mule (mare) about 13 hands, branded on near hind quarter P.J.

Acton Homes.—Iron grey mare, piece cut out of left ear, branded on right leg O.H.; bay mare, black points, branded on left leg L.L.

Richmond Road.—Dark brown mule (mare), medium size, branded [indescrivable] on near hind quarter, Q on near shoulder, 2 on near side neck, saddle marks and white spots on both sides; dark grey gelding, about 14.1 hands, aged, branded O.E. reversed, and Government cast brand near hind quarter, sore back.

Pomeroy.—Grey gelding, about 14.2 hands, aged, branded G.V. (V indistinct) off flank, swellings both sides neck and behind shoulders; grey mare, about 14.1 hands, aged, no brands, with chestnut filly foal.

Krantzkop.—Black ox, aged, no brands; dark grey cow, aged, no brands.

Weenen.—Black bull, C 17 left hind quarter, little white on belly, about 2 years old; probable value, £8. The above animal will be sold at the expiry of one month from date (March 31st) if not previously released.

Moguntia.—Dark bay stallion, dislocated shoulder, one eye recently knocked out, been in pound before, branded 'P.' Sold some time back to Mr. G. Iorkan for £2; probable value, £1. Impounded by native Lingani on 31st March, 1903. The above animal will be sold at the expiry of one month from this date (2nd April) if not previously released.

Richmond.—Running at Arnold's Hill, cream coloured mule, star on forehead, brand Y on near hind quarter, very small.

Dundee.—Dark iron-grey gelding, branded off buttock N N, near eye blind; bay mare, four white feet, long mane and tail, white face, branded, looks like N D off buttock, J M near buttock (unbroken); bay filly, white face, long tail and mane.

Nkandhla.—Dark brown mare, about 14 hands, about four years old, small star on forehead, hogged mane, slit in off ear, black points, small scar on off shoulder.

Gold Luck, Dronk Vlei. Bay mare, branded O on the off shoulder, about 14 hands high, and eight years old.

CORRECTION.

Meran.—With reference to Government Notice No. 223, published in the *Natal Government Gazette*, of the 24th March last, it is hereby notified, for general information, that the animal advertised as being in the Pound at Meran, should have been described as "Red Cow" instead of "Red Ox."

Weekly Rinderpest Report.

UP TO 4TH APRIL, 1903.

Krantzkop Division.

Amohonvu Location.—Fresh outbreak; 1 dead; 13 sick.

Estcourt Division.

Rosendale.—Fresh outbreak, cattle of J. W. Moor:—3 dead; 40 sick.

Zululand.

Eshowe District.—13 dead; 53 sick.

Mahlabatini District.—No report received.

Umlalazi District.—8 dead; 7 sick.

Lower Umfolosi District.—10 dead; 34 sick.

Nkandhla District.—9 dead; 8 sick.

Nongoma District.—4 dead; 3 sick.

Hlabisa District.—No report received.

Vryheid District.

No deaths; no fresh cases.

M. J. HIME,
for P.V. Surgeon.

14th April, 1903.

Meal for Working Oxen in Winter.

FOR working oxen during the winter I know (says "Agricola" in the *Witness*) that it pays to feed with mealie meal, even if only a small quantity is given. A pint of mealie meal feed on chopped hay or turnips, which have been damped, will go a long way to keep working oxen in good condition, especially if they get shelter when not on the roads. This has been tried more than once on the road between Maritzburg and Howick. The oxen were fed on hay the night they had to sleep on the Town Hill, and their feed of damped hay, roots and meal was put ready for them when

they got home the next night, and they worked on when other teams were at a standstill, they were so thin. If a small quantity like this will keep trek oxen at work in winter, it will surely pay to give it to them even at present prices. Farmers cannot afford to have their working oxen thin during the winter. There is always work to be done, and it is at a time when the prices paid are at their highest, as there are not the number of wagons working that there are in summer. From this it would appear to pay to feed working oxen as well as milking cattle in winter.

The Eucalyptus.

MR. RICHARD T. BAKER, F.L.S., curator and economic botanist of the Sydney Technological Museum, and Mr. Henry G. Smith, assistant curator and chemist, have together, says the *Australasian*, produced a most valuable work on the "Eucalypts and their Essential Oils" (published by the Government printer, Sydney). The chemical chapters, dealing with the oils yielded by various species, are written in technical language, but this should enhance the value of the text for all who desire to obtain exact information in order to turn it to practical account. Eucalyptus oil is now in universal use for medicinal purposes, you meet it everywhere, but the manufacturing of it may be considered still limited. In this "Research," as it is termed, the botany of the subject is first dealt with. The authors begin by telling us that the genus was first named *aromadendron* (aromatic tree), by Dr. William Anderson, surgeon of Cook's second and third expeditions, when he was collecting with Captain Furneaux, in Tasmania, where Hobart now stands. Eucalyptus (from *eue*, well, and *kalypto*, discover) was the name chosen by L'Heritier, the French botanist, in 1788. It hits off the beauti-

ful arrangement by which the calyx is covered with a lid prior to the bursting out of the flower. The eucalyptus belongs to the natural order of which the myrtle is the type. Except that it is without petals, it has the myrtle flower and the myrtle leaf, with, in addition, certain important characters all its own. The eucalyptus leaf is the most important fact of the whole tree, the source of the essential oil, and the *raison d'être* of this work. There is great variety in the oils yielded. Numerous fine illustrations are given of eucalyptus leaves. The trees, we are told, form about three-quarters of the vegetation of the Australian continent, and they are evidence of its lengthened isolation from the rest of the world. There is yet much to be learned about them; for instance, it is not settled whether the two lemon-scented gums, which come from Queensland, one from inland, the other from the coast, are identical or distinct species. Of the 120 species growing in New South Wales there are nine yet to be investigated.

One of the subjects discussed in this work is what some readers may consider a fanciful one—the probable evolution of the eucalypts. Their genealogy is

given. Mr. Baker, who, it may be assumed, is responsible for the views set forth, thinks the eucalypts are descended from the angophora, and on page 21 he presents us with a scheme which is suggestive of the "family tree" in Burke's "Peerage," tracing the descent of the reigning sovereign from King Arthur. At the top he puts the angophora; next come *E. tessellaris*, *E. brachyphloia*, etc. The eucalyptus globulus, or blue gum, at the bottom of the long list, occupies the position of Nature's latest achievement, and it is conjectured to have come down to us through 22 distinct progenitors. There appears to be a good deal in the case tentatively made out; at any rate, it is based on evidence most interestingly put forward. Many attempts hitherto made to provide an orderly classification for the eucalypts have failed, we are told, through such characters alone being noted as come under the eye of an observer dealing with dried specimens. The authors of this work contend that the difficulty vanishes when you study the eucalypts as they are found growing—when you take note of their modes of growth, bark, timber, forms of flowers, fruits, and leaves, and also the chemical

constituents of the leaves. The relationship between the venation of the leaves and the composition of the oil found in the leaves is remarkable. Both characters show constancy. Why the angophora has been selected as the progenitor of the eucalypts is that its flowers, except in having no lid, its leaves, and its oils are identical with similar characters in the bloodwood group of gums. A series of leaves, reproduced by photography, is given to bring before the eye the resemblances and developments which are insisted on by Messrs. Baker and Smith. Even if the genealogy they have sketched be regarded as purely conjectural, it suggests a line of study which may lead to valuable discovery.

The main part of the "Research" (from page 22 to 211) consists of separate descriptions of upwards of 110 species of oil-yielding eucalypts, all found in New South Wales. Some of these species also occur in Victoria, Tasmania, Queensland, and South Australia. Notes are added on a few species peculiar to other parts of Australia. The characters of the oil yielded by each species are fully set forth. From page 212 to the end (287) the subject dealt with is the chemistry of the eucalypts.

Powdered Milk.

FOR more than fifty years scientists in all civilised countries have been trying to separate the water and the fat from milk, and secure all the other solids in such a condition that they could be restored to milk by the simple addition of water. The physical and chemical difficulties in the way of the solution of this problem were very great, and none of the ordinary processes of condensing milk were of any perceptible assistance in solving it.

After devoting nearly three years to the subject, and spending nearly £20,000 on his experiments, Dr. Joseph H. Campbell, of Pennsylvania, has (according to an American paper) succeeded in

overcoming the almost insurmountable difficulties, has perfected a successful process, and has a large plant already in operation. A series of revolving cylindrical tanks into which blasts of sterilised air are forced constitutes the principal part of the machinery of the process. After the milk has been dried to a solid, it is taken to a large pebble mill and ground to powder. The resulting product resembles fine wheat flour in appearance, and is suitably packed for transportation to all climates. It will also keep for an indefinite length of time.

The value of this process and its resulting product cannot possibly be overestimated. Wherever it can be put into

operation, it will make skim-milk, that much-wasted by-product of butter making, more valuable than the butter itself. Milk yields but four pounds of butter for a hundred pounds of milk, while it yields nine and one-half pounds of this dry powder per hundredweight. If it were practicable to utilise all of the skim-milk from the creameries of this country in this way, the value would run into the hundreds of millions of dollars, and exceed the value of the wheat crop.

The great need of such a product and the many uses for it are exceedingly obvious. It will make milk possible in the tropical regions where it has hitherto been unobtainable. It will form a most palatable addition to the rations of the soldier and sailor, and to hospital dietetics, in the smallest bulk with the least possible waste. It will be a boon in large bakeries, where so much fresh milk is now wasted and spoiled. It will be a great help in reducing the infant mortality in large cities, and will furnish poor people generally with a form of milk that is pure and reliable as well as cheap. Its extreme concentration renders the cost of transportation very small in comparison with whole milk, and there is every reason to suppose that the demand for it will soon far exceed the supply.

The Monarchs of the West.

DROUGHT speaks.

In the fierce heat of summer I bore him.
When my iron-like grip held the West;
I withered my kingdom to feed him,
I cherished him close to my breast;
My task is well done
Ere his is begun,
I come—and my son does the rest.

BUSH FIRE speaks.

O'er the West I hold sway with my
mother,
Burnt sacrifice plenteous I claim,
And the hoofs of my charger strike fire,
And the breath from his mouth is of
flame;
And the parched, withered grass
He consumes as we pass,
—The Bush Fire King is my name.

DROUGHT speaks.

I fall on the earth like a shadow,
I drink up the creeks as I go,
In vain do they try to forestall me,
Relentless my course is if slow;
And close on my heels
The Bush Fire steals,
—'Tis little of pity we know.

BUSH FIRE speaks.

Like the wind I sweep o'er my
dominions,
My godhead in smoke clouds I veil,
At the sight of my pearly grey pinions,
Men bearded and bronzed may grow
pale,
For the touch of my breath
Carries swift, certain death,
What wonder the bravest hearts fail?

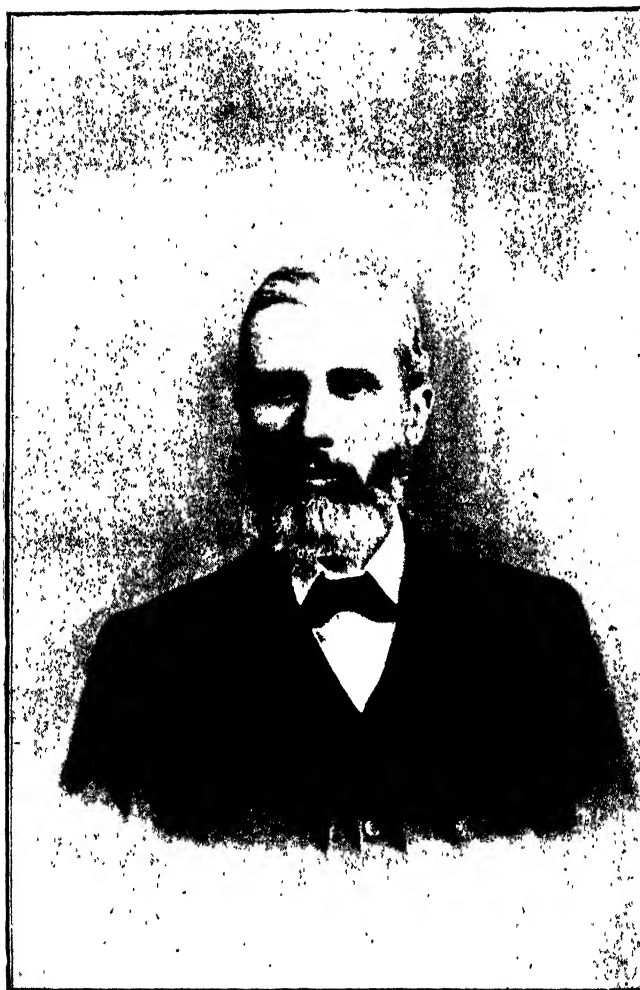
BOTH.

In vain do mankind try to check us,
In vain put an end to our reign,
Even tho' for the time we be conquered,
'Tis but to return soon again;
Dreary wastes burnt and black,
And charred bones show the track
Of the Kings of the Great Western
Plain.

By Diamid in *The Pastoralists' Review*,
Melbourne.

A Montreal paper says that very few cattle are being exported from Canada to England just now, the market at Chicago being so good. It also states that very shortly both the United States and Canada will need all their beef for home consumption.

The new Federal (Australia) telephone regulations show a great improvement upon the previous State arrangements for private telephones to connect stations with other stations or out-stations or to railway offices or post offices. All future lines, when erected by the department, will be supplied at rental of 25s. per mile yearly, same to be taken for not less than a period of six years in order to ensure a return upon capital invested. The license fee enabling wires to be carried above roadways is reduced to 5s. per annum irrespective of length of line or number of roadways crossed. It remains for individual pastoralists and others to show by a more general adoption of telephonic service that this measure of reform is well advised. We write from a full knowledge of the negotiations which took place in saying that pastoralists are largely indebted to Senator Sir F. T. Sargood for these reforms. He urged them upon most unwilling officials, and succeeded in obtaining them by sheer persistency.



MR. F. A. R. JOHNSTONE,
Minister of Agriculture, 1898-1899

Mr. F. A. R. Johnstone.

MINISTER OF AGRICULTURE, 1898-1899.

FACING this page will be found a portrait of Mr. F. A. R. Johnstone. Mr. Johnstone was the second Minister of Agriculture, and succeeded Mr. Edward Ryley. A good many years have elapsed since Mr. Johnstone took interest in public matters. In 1867 he was elected member of the Transvaal Volksraad for the Wakkerstroom District. His colleague was the late Commandant General P. J. Joubert. In 1879 he was appointed a Member of the Legislative Council under the Administration of the late Colonel Lanyon. In 1882, on the retrocession of the Transvaal, Mr. Johnstone removed to Natal. In 1890 he re-entered public life as Member of the then Legislative Council for Newcastle. His platform was that of

the "Responsible Government" party. For eleven years he was a representative of the Newcastle constituency in Parliament. In 1898 he joined the Binns' Ministry as Minister for Agriculture. During his term of office the Veterinary and Mines' Departments were made directly responsible to the Minister; the new Mines Law and Regulations were drafted and passed into law, investigation work in diseases of stock, especially horsesickness, lungsickness, and rinderpest was taken in hand, and the epidemic of rinderpest was brought to an end. During Mr. Johnstone's term of office the *Agricultural Journal* was started. In February, 1899, Mr. Johnstone retired from office.

Horsesickness Investigation.

SECOND INTERIM REPORT.

The Laboratory,
March 13th, 1903.

To the Hon. Minister of Agriculture—

Sir,—Some months ago I forwarded a short Interim Report on the results of my work in connection with Horsesickness. This report, dealing entirely with the question of the aetiology or causative factors, did not attempt to set forth a comprehensive description of the disease. I am now bringing under your notice some further proofs of the correctness of the theory then formulated, which provided for the agency of winged insects in the spread of the disease.

The question of an adequate treatise on Horsesickness which will attempt to summarise and bring up to date our knowledge of the disease is now engaging my attention, but it must, in view of the amount of work still necessary to the elucidation of the various points concerned, be a matter of time before I am able to lay this before you.

In forwarding the last Interim Report on the subject I stated that the observations it contained were taken from their context and brought forward in order to reserve any claim to priority which might be deemed necessary, and this Second Interim Report is intended simply to extend the results of the former observations.

The principle of the hasty publication of results—often lacking in continuity—is generally to be deprecated, but the notice which the disease has attracted of late amongst scientific workers renders imperative early publicity.

I am, therefore, forwarding a continuation of my previous observations of this one branch of the investigation, and must leave the other no less important branches to be dealt with in a similar manner in due course.

As the observations below contain a definite expression of opinion on the important question of the manner in which the disease is spread, I have thought it

useful to briefly review the published opinions of other workers in the same field.

This will serve to show the diversity of opinions which are held by those who have attempted the investigation of the disease, while the many views entertained on this point by the public generally are too well known to need recalling.

Probably more variance of opinion is apparent in the discussion of the question of the aetiology or causative factors of Horsesickness than upon any other point in connection with the disease. Various opinions, as far back as 1855, seem to have been recorded as to the nature of the malady, but until the article published in 1881 by Colonel Lambert, the late Director of the A.V.D., then Inspector V. S. Lambert, which ascribed the disease to the *Bacillus Anthracis*, no definite theory was formulated. The report, which was published by the direction of the then Governor of the Colony, bore the title "Horsesickness or Anthrax in South Africa." Seven years later an investigation was undertaken by Mr. Nunn, F.R.C.V.S. (now Vet.-Colonel Nunn), at the direction of the War Office Authorities, and this investigation resulted in disproving the agency of the organism of Anthrax in the production of the disease, and also in directing the attention of observers to the possibility of the "Malarial origin" of the disease. This somewhat vaguely used term will be found also in earlier writers, but without any very definite idea being conveyed to the mind. The older use of the word "malarial" was almost synonymous with "miasmatic," an noxious exhalation from damp or marshy ground exerting its injurious effects, presumably, through the respiratory system. The reason for the use of the word in connection with the disease Horsesickness is apparent, from its constant mention mist, damp grass and moisture generally. Low-lying mists and dews remarkable for their copiousness, bitterness, etc., are frequently mentioned in past dissertations on the aetiology of the disease, as well as the fact, ascertained early in the

history of South Africa, that the keeping of horses on low-lying, marshy ground was attended with a much higher degree of fatality than where such animals were kept on the higher ground and elevated pastures of the mountain ranges. Relative altitude, as distinct from elevation above sea-level, was also recognised as a factor connected with incidence of disease. In fact, the theories existent up to date may be fairly summarised from the following extract from a paper recently furnished by Dr. Edington to the *Journal of Comparative Pathology and Therapeutics*, in which he says :—

"Horsesickness occurs mostly in low-lying parts of the country, independent of the fact that the general locality may be considerably elevated above the sea-level; thus Johannesburg, which is about 6,000 feet above the sea-level, is frequently subject to its baneful influence.

"Certain atmospheric conditions seem to favour the production of this disease, for it is commonly observed to occur during periods when the air has become humid, and has been associated with a high daily temperature.

"Deep kloofs or gullies, where vegetation is abundant, and the ground, below the undergrowth, moist, are especially dangerous to susceptible animals. During a season of sickness it has been commonly observed that animals which are not allowed to graze after sundown nor before the sun has dried up the dew from the herbage, do not so readily become affected, but that where this routine is not carried out mortality commonly occurs."

While such conditions have been so fully recognised in the past, it will seem strange in a high degree that the parallel of the malaria of human beings should not have received more serious notice at the hands of investigators. Since the aetiology of human malaria has been placed upon a firm footing by Manson's epoch-making hypothesis, formulated first in 1894, and proved in so conclusive a manner by the experiments of Ross, Grassi, and others, it would seem a

natural transition of thought—to those interested in the question—to apply such a parallel of disease conditions to the solution of the aetiology of South African Horseshickness.

In reviewing the literature of the disease (which of late years has become considerable), it is a matter for surprise that so salient a parallel should have been completely overlooked until the suggestion made by Prof. Nocard, at the Central Veterinary Medical Society, Paris, January, 1901. Prof. Nocard, in discussing the aetiology, says:—

“It appears possible that Horseshickness may be caused like malaria, by the bite of some nocturnal insect, but what insect is as unknown as what is the actual virulent agent of the disease.”

This is the only suggestion as to the agency of insects in the transmission of the disease which I have been able to discover, besides a theory brought forward by Theiler, of the Transvaal, to which I shall refer later. At the time this theory was formulated in Paris we had, in Natal, already gone far towards securing the proof of the correctness of this theory, as you will see from an examination of the books of the investigation for the years 1898 and 1899 and 1901.

A close attention to the facts concerned in the production of the disease, on my arrival in Natal some eight years ago, soon led me to discard most of the theories current on the aetiology, or, at any rate, to preserve a very open mind on the subject. The universally accepted Dew-theory seemed on close examination to be found wanting in several respects. A vivid imagination is stated to be an essential part of the mental equipment of the successful scientific investigator, and it is interesting to follow the flights of fancy which have twined themselves round this poetical subject of the dew-fall. Aerial microbes, high-flying vegetable spores, and gauzy spider-webs have been associated inseparably in the hypotheses of some investigators with this harmless condensation, while exhalations, brown, bitter and poisonous have been asserted to have risen and impregnated the same, converting the limpid

evening dew in a veritable cup of Lethe. Even now the theory is so strongly maintained by a South African investigator of much repute, that I hesitate to attempt its refutation, and take up a brief in defence of this gentle vapour.

McFadyean, indeed, of the Royal Veterinary College, whose acumen is equal to his care and scrupulousness in scientific work, in summing up the evidence available, says:—

“If the eating of dew-laden grass is a factor of any importance in the causation of the disease, it is one that would be very difficult to explain. In spite, however, of the fact that such an opinion appears to be very generally held in South Africa, it is permissible to entertain some doubt with regard to its accuracy,” and he expresses his belief as to the nature of the infective agent as follows:—

“It appears to be almost certain that *infection by ingestion must be the method by which the disease is usually contracted in South Africa*. Infection by inhalation may apparently be excluded, for there is abundant evidence to show that the disease is not communicated by simple cohabitation of healthy and diseased horses, and that even in districts in which the disease is very prevalent, horses may be preserved from infection by stabling them and withholding green food grown in the locality. In some of my own experiments a healthy pony was kept in the same loose-box with an infected subject, from the time of the latter's infection until its death, but in no case did the healthy pony thereby become affected. The possibility of infection by the bites of insects is perhaps not absolutely out of the question, *but in view of the escape of stabled horses that cannot be a common method of infection.*” —*Journal of Comparative Anatomy and Therapeutics*, March, 1900.

It will be remembered, however, that Prof. McFadyean has not enjoyed the advantages of an investigation of the disease amid its natural South African surroundings, otherwise it is possible that he might not have expressed his opinion on the aetiology of the disease with so much emphasis.

Edington, who has made extended observations upon Horseshickness, inclines to the belief that in Cape Colony the disease is contracted by feeding "before the sun has dried the dew from the herbage," also that "certain atmospheric conditions" favour its production, and that the disease may be avoided by horses travelling through the night if nose-bags are worn, and, in summing up the question, he says, "These statements, which by tradition and after careful observation, have been unquestionably accepted as facts in South Africa, serve to eliminate the bites of ticks or blood-sucking flies as the usual or common agent of infection."—*Journal of Comparative Pathology and Therapeutics*, September, 1900.

Theiler, of the Transvaal, to whom I made reference before, wrote to me in 1901, and made passing reference to his opinion as to the origin of the disease which led to the publication of a paper in the *Natal Agricultural Journal* (September, 1901), in which he stated as his opinion that the disease was produced "very possibly through the bite or puncture of some blood-sucking insect." This hypothesis had long seemed to me a tenable one, since following the brilliant working out by Ross of Manson's theory of the mosquito transmission of malaria. No easily demonstrable intra-corpuscular body existed however, or even the minutest visible organism by which a parallel could be instituted, or life cycle traced. This certainly seemed to render the analogy of dubious application, but the undoubted paludal nature of the disease, its seasonal and crepuscular or twilight incidence, the protection afforded by altitude, stabling, etc., etc., all seemed to render the parallel too close to be discarded without full enquiry. Such enquiry, being carried on together with the investigation of other possible causes, tended to become strengthened as these latter became improbable or impossible. In this connection, I may say in passing that it is a matter of much regret to me that my association with Bruce as a fellow-worker was of so short duration; his exactness of method and powers of

trained observation being a great loss to the cause. During the time, however, he was working in my Laboratory we were able to observe much in the way of periods of incubation, *post-mortem* appearances, qualitative blood counts, specific gravities, and general microscopic work, besides a short though comprehensive study of the clinical side of the disease. Had his co-operation been available throughout, the work would have progressed in a less halting and intermittent manner, and probably have happily resulted in more striking observations than I am able to lay before you here.

From the investigation books you will see the large amount of work involved in the elucidation of the various points dealt with, and that in this Interim Report I do no more than give a hasty resumé of the work done in the past, leaving the description of the investigation work to be dealt with in a more comprehensive treatise on the disease, which I hope to forward to the Government before long.

Acting upon the inferences and deductions attending a close observation of all the facts of the disease, I made definite arrangements before the commencement of the late campaign to test the validity of what I may call the theory of insect-conveyed Horseshickness, in which I sought to prove the agency of some winged insect in the production of the disease. The possibility of the disease being conveyed by winged insects had long seemed possible, for often on previous occasions of camp life I had observed mosquitoes, replete with blood, alighting on the inner wall of the open tent, apparently attracted from the horses in the vicinity to the lamplight. It was not until January, 1901, after my return from the front, that I was able to put the theory to a practical test, by placing horses in protected stables, so preventing the ingress of all forms of insect life. Such stables with walls of gauze, or fine netting, were constructed in a manner that conditions as nearly approaching the normal were secured, while horses controlling the experiment were tied outside the box, but under the

same roof. I will not enter fully into the details of this experiment, or describe its many repetitions, and the delays attending a positive result through the entire absence of the disease from the district in which the experimental camp was situated. It was not until steps were taken to collect specimens of the mosquitoes of the district and feed them on the blood of a horse suffering from artificially produced Horseshickness, that positive results were forthcoming. With these results you are already familiar, as they were laid before you in May of last year (1902) in the form of an Interim Report. In that report, I may remind you, I said, in referring to antecedent experiments:—

“The above strange disturbance of the system of the horse after the bite of a mosquito which has been previously fed upon an infected animal, has occurred on every occasion (six times) upon which the experiment has been repeated, as the accompanying charts will show.”

I have again brought some of these charts under your notice, and submit them for the purpose of comparison with other charts, which illustrate the converse conditions of infection, viz.: Cases in which, *while the animal confined in the protected box remains free from the suspicion of disease, the control horses standing close at hand outside the box have in succession fallen victims to this fatal equine malady.*

This observation has been possible only after the expenditure of considerable time and trouble, for it has been necessary, in order to ensure reliable natural disease-condition to carry out the work in the north of Zululand in a district, kindly suggested by Mr. Saunders, C.M. and C.C., notorious for the sickness. In this way the long delay and disappointment attendant upon the efforts of previous years to ensure disease conditions have been avoided.

The result seems to me capable of no misinterpretation, but in order to strengthen and confirm this finding, which must necessarily become of no little importance to the horseowner and breeder of South Africa, further obser-

vations have been made to prove the possibility of ensuring protection, apart from that mechanically afforded by an insect-proof stable. It may be objected that the gauze of the stable restrains in some manner not only the infectious insect, but may prevent the entrance of the *materies morbi* which, in the form of a floating spore, bacterium, or drifting exhalation, might otherwise gain access to its ultimate equine host.

This objection to the theory, though not a valid one, I think, has been met by stabling horses throughout the night in buildings or rough shelters in which fires of horse dung have been kept smouldering throughout the hours of darkness. In no case has a fatal result followed, although stabling without smoke has not afforded protection. I lay before you the charts of the horses so treated in order that you may compare the steady, even temperature of the animals protected either by an atmosphere of smoke or by gauze netting with that of the animals tethered close by for the purpose of controlling the same. The comparison is instructive and interesting. Stabling without smoke has not afforded protection.

I append a rough ground plan of the camp in the Beganuse Valley, in Zululand showing the position of the various experimental boxes, etc. The gauze-protected box marked “X” has contained a horse (No. 52) for over seven weeks. All experimental animals were previously carefully protected from possibility of insect bite, by being travelled to the spot only during the hours of daylight. No. 52 was placed in the box on January 24th, and outside the box on each side of him was placed a normal control horse. No difference was made in the treatment of the animal in the box and those horses which were controlling him outside, except that the latter were stood on ground carefully cleared of all grass and sterilised by fire, and these animals, until the time their carcasses were dragged off the ground, had received nothing but crushed corn and baled hay, fed out of a manger, and carefully protected from risk of being exposed to the dew or dust, etc. The

horse in the box, on the other hand, has been fed regularly with grass cut while wet with dew, at early dawn and at dusk, and a little corn has been allowed to help the animal to maintain his condition. I may here remark that the dew-point has been observed both in Experimental Camp and at the Laboratory for the last three years (nearly) without any direct connection between the dew precipitation and the disease-incidence being apparent.

To remove a further objection that the infection might have been conveyed by the drinking water, the animal within the box has been watered directly from the spruit closely contiguous, while the controls have had only water which has been boiled shortly beforehand and covered while cooling. The same treatment has been observed in the case of the animals in the wattle-and-daub stables, in which a small fire has been kept smouldering, being set going as soon as the sun began to get low. In this case, however, the horses in these stables have been brought out after sunrise, and have enjoyed liberty throughout the day under normal conditions of environment and natural feeding, etc., while during the evening dew-laden grass has been fed to them. The result is shown in the accompanying charts, which need no explanation. The animals which have been protected even by a light haze of smoke are still in vigorous health, while their controls have contracted typical Horsesickness, and in every case except No. 53 have died from the disease. You will observe that the experiment has been repeated, and that up to the present time the dead control horses have been replaced by other normal animals, which have in their turn succumbed. In this way the objections of insufficiency of data, possibility of coincidence, etc., have been practically eliminated, and I now feel free to look upon the foregoing observations as establishing in a scientific manner the fact that:—

Horses protected from the attacks of winged insects, either by efficient stabling, a smoky

atmosphere, or other means, enjoy immunity from Horsesickness.

I am not yet in a position to state that a single species of winged insect is responsible for the transmission of the disease, or, indeed, that this is the only manner in which the horse may become infected. Circumstantial evidence, however, apart from other disease parallels, strongly points to the agency of one or more species of mosquito of the genus *Anopheles* as alone concerned, and I believe this observation will be capable of being established with more extended observation. I have been unable to classify the insect with which my results have been secured, they bear a close resemblance to the *A. funestis*, but differ in some particulars. If this insect is responsible solely or chiefly for the spread of the disease, I shall ask the assistance of the Government Entomologist in the elucidation of the life-history, habits, etc., of the fly.

I am, however, unwilling to express a decided opinion as to the *Anopheles* being the sole transmitter of South African Horsesickness. Since commencing to work at the insect-borne theory of Horsesickness, the aetiology of yellow fever has been worked out in Havana by Surgeon-General Sternberg, who has made observations of the greatest interest. The points of similarity between the two maladies are striking. One point, however, is of exceptional interest. It will be seen on reference to the Investigation Book for 1899 that Bruce and myself demonstrated the possibility of the infective agent of Horsesickness passing through a fine porcelain (Pasteur) filter. I have also been unable by the most careful microscopic examination to detect any organism in the infected blood at any stage of the disease. It has been proved within the last few months that the contagium of yellow fever can also pass the finest pressure filter, and, further, that microscopic observation has been unable to demonstrate the existence of an organism. When we remember these similarities and find that yellow fever is also

transmitted by a mosquito of a nearly allied genus (*Stegomyia*), the parallel between the two diseases becomes more marked, and removes one of the earliest difficulties in my mind in considering the possibility of the mosquito being able to transmit, not alone a large easily demonstrable organism such as that of human malaria, but also a disease, the infective agent of which is so minute as to escape alike the highest lens and the finest filter.

I show herewith a rough sketch of the mosquito which produced the curves as shown in the charts previously laid before you. I am at present endeavouring to demonstrate the existence of structural changes in the body of this mosquito after infection, but must reserve this point, together with many other points of importance, to a future occasion.

To return to horse 53, the one animal surviving the exposure as above, to which I would call your attention, I have for purposes of easy comparison, shown against his temperature curve that of the protected horse in the box within an arms length of him. (I need not trouble you with the *post-mortem* reports of the horses which have succumbed, they are in all cases typical of South African Horsesickness, and their manner of death and *post-mortem* appearances left no room for doubt.) As this is the case, we are not unduly forcing the conclusion when we assume that the extraordinary fluctuations of temperature in this horse No. 53 are due to the same cause as that which has produced the death of the surrounding animals. This assumption is justified, if indeed further proof is necessary, by observing the clinical notes made during the time this animal has been describing these abnormal curves. Injected lachrymal membranes, swollen supra-orbital fossae, coarsened muzzle, etc., etc., warrant our diagnosis apart from the considerations of a deadly environment, and marked and otherwise unaccountable hyperpyrexia.

The significance of this case becomes more marked when we recall the similar constitutional disturbances producible in the system of the horse by subjecting

him to the bites of artificially infected anopheles. If a comparison is made of the chart of this refractory horse, No. 53, with that of 3 under triangle (which is also a case of natural mosquito infection), or that of No. 21 (which shows a curve caused by the artificially infected anopheles and a marked relapse or secondary curve), No. 53 is susceptible to the specific attacks of the mosquito to the extent of grave constitutional disturbance, but is capable of withstanding a degree of infection which proves deadly to his fellow controls. We are justified, therefore, in considering that this animal is undergoing a series of inter-current infections (such as are well known to occur in malaria), due to his frequent infection at irregular intervals, and the fluctuations of this animal's chart are, I consider, due to this cause. That this intermittent infection in the exposed horse is of frequent occurrence, there is no doubt. Upon many occasions in my past investigation work I have noticed marked remissions and exacerbations of temperature, together with suspicious physical symptoms in exposed horses, quite apart from any possible climatic influence. Such cases, I believe, I am right in attributing to the inter-action of varying degrees of susceptibility with varying degrees of infection, producing physical symptoms in the horse noticeable only by careful clinical observation, or the constant use of the thermometer. *In short, the infection in Horsesickness is one of degree as well as of kind, and it is this difficulty of varying individual susceptibility which, as Edington first pointed out, forms our great obstacle in devising uniformly successful preventive measures.**

In quoting last year from some records of observations which I had previously made, I said:—"The fact that a fatal issue does not certainly attend the infection of a horse by means of mosquitoes, presents to my mind no great

*Since writing the above, this horse, No. 53, has succumbed to the disease, and thus every animal exposed, as a control case, has contracted the disease, without a fatal case occurring in any of the test animals.

objection in considering the possible agency of mosquitoes in the production of the disease, for I have recently been able to prove to my satisfaction the possibility of inducing in the horse by other means a non-fatal but undoubtedly specific form of horsesickness." These means referred to consisted in the production of a manageable form of the disease by the administration of a minute quantity of the virus of the disease. For years past—my earliest recorded observations and *post-mortem* notes on this subject date from 1897—I have noted the specific incidence of the disease, even when produced by the hypodermic syringe, upon the gastro-intestinal tract, particularly upon the right half of the stomach of the horse. The morbid process, hitherto described as an inflammation by McFadyean and others who have subsequently described this lesion, is often so intense as to remind one of the appearance of a stomach after arsenical poisoning or some violent irritant. This curious lesion can, I consider, be considered pathognomic of the disease as seen in Natal, although I am aware that Edington holds other views as to its constancy and significance in other parts of South Africa. The fact of this repeatedly recurring *post-mortem* appearance, the complex pathology and histology of which I must leave to some other occasion, led me to consider the possibility of inducing an immunity, or tolerance, by means of the gastro-intestinal tract, rather than by that of the vascular system, and it was in attempting to establish the minimal lethal digestive dose that I was struck both by the very varying susceptibility in the horse and also by the degrees of virulence in the infective matter. I am hopeful that some practical method of inducing a tolerance which will exceed the natural infection will be possible on these lines, and it is in this direction that I am now working, not altogether without promise of a practical issue.

I have long been of opinion that the production of a permanent and harmless form of immunity in Horsesickness is obtainable only with considerable difficulty and risk, and I am not satisfied

that I have met cases of permanent immunity which have been established without physical disability to a greater or less degree.

The principle upon which I am endeavouring, therefore, to establish a protection is by constant habituation of the system of the horse to a frequently administered non-lethal dose of virus. This habituation, or tolerance, may without any great nicety of graduation be established in the horse to an extent which I have reason to believe will enable the animal to resist natural infection. The difficulties are both in the gauging of individual susceptibilities and in standardising the actual virulence of the infective agent, points in which Edington also, working on different lines and with a different principle, has found so serious a drawback to the progress of his system of producing a serviceable immunity.

The field of enquiry is an immense one, and seems to broaden with investigation, the pathology of the disease alone affording scope for lengthy research. While immunising and perhaps curative measures may follow in time, we can from now do much, in view of our developing knowledge of the manner in which the disease is transmitted to guard against the ravages of the disease amongst stabled horses.

The horseowner's time-honoured apprehensions as to dew, mist, cobwebs, and wet grass, etc., will, I believe, rapidly become dissipated with the recognition of the certain risk of transmission by means of flying insects, while his faith in the nose-bag, applications of Stockholm tar applied to the nostrils, etc., and other more fantastic precautions must slowly become abandoned. Wire gauze frames to fit stable windows and doorways closed at or before sundown, or the more simple method of generating smoke in stables throughout the night has been proved to keep the disease at bay even amid the most deadly surroundings, and the establishment of these main points will suggest to the intelligent horseowner means to guard against the chief, if not the sole, agent

by which the disease is transmitted in our Colony.

I am diffident about asserting the application of the foregoing observations to other parts of the sub-continent, more especially as they not only overturn the popular conception of the cause of Horsesickness which has been universally accepted from the earliest recorded times, but also because they are not in accord with the opinions and observations of other scientific investigators whose qualifications and experience entitle their views to serious consideration.

It seems to me, however, improbable that the aetiology or cause of South African Horsesickness in Natal is essentially different from that obtaining in other parts of the Cape and more northern Colonies. Results of recent Natal work establish the conclusions:—

1. That the carrier of the infection is a flying insect.

(That this insect is a mosquito is strongly indicated by the fact proved by experimental observation, that a disease indistinguishable from Horsesickness can be transmitted experimentally through its agency when the insect has previously been infected).

2. That, though carefully sought for, no evidence is forthcoming to support the theory that dew, damp grass, water, earth, or other such agency is concerned in the production of the disease.

The *onus probandi* of any of these theories must now, therefore rest, with those who still entertain such.

A large number of problems still remain for elucidation even on this question of the aetiology of the disease although our views as to the manner in which it is transmitted are thus broadened. The natural habitat of the organism, the variety and species of fly in insect able to transmit it, and several other points in connection with this matter are still unknown to us, which, together with the devising of immunising measures against the disease, its pathology and therapeutics, as well as practical details in connection with protection from insect attack, will

furnish ample ground for close enquiry for some time to come.

The experimental work is still in active progress in Zululand under the able supervision of Mr. Henry Power, and I shall hope before the winter commences to be in a position to furnish you with another Interim Report on the progress of the investigation.

The work in progress during the past winter had unfortunately to be abandoned owing to the necessity of my proceeding to Rhodesia in connection with the disease prevalent there, otherwise I might have been able to have reported progress before this.

I have the honour to be,

Sir,

Your obedient Servant,

HERBERT WATKINS PITCHFORD,

Govt. Bacteriologist and Director,
Veterinary Department.

The earth-nut or pea-nut (*Arachis hypogaea*) has come to be considered one of the best foods for poultry, whether laying hens or growing chickens, excelling maize, wheat, or oats. Unlike the first two it does not over-fatten, and keeps the birds in good health. They are thrown with tops and all, and keeps hens busy all day.

The Hen as an Egg-laying Machine. — "A French Scientist" declares that the average healthy hen generally contains about 600 eggs, and that as a rule it takes nine years to lay them. He states that more than half the eggs — between 300 and 375 — are laid during the second, third, and fourth years, and then gradually decrease, from 15 to 30 being laid in the eighth year, and from one to ten in the ninth. If this is correct, it is certain that it will not pay to keep the egg-laying commercial hen after the fourth year. Here it will be observed that no mention is made of the eggs laid by the hen when a pullet of the first year, which sometimes amounts to a considerable number. Again, it has been recorded that a pencilled Hamburgh hen laid in the second year of her life the large number of 275 eggs, and in the third year she laid just over 200, which last number was not, if now, unusual. Game hens have been known to lay fertile eggs at nineteen years of age, but this is a very uncommon case, as hens, unless they are of a valuable pedigree stock, are seldom kept longer than eight to ten years; and this is so with cocks, but it is on record that a very celebrated white fighting cock (a Smock) had chickens hatched to him after the age of twenty years.

Wells.

THE difference, says *Queensland Country Life*, between a shallow and a deep well may be broadly stated thus, that whereas the former is under 50 feet deep, the latter exceeds that depth. The diameter may vary from 3 feet 6 inches up to about 7 feet; 3 feet 6 inches and 4 feet diameter being the usual sizes for country residences. An Abyssinian or tube-well is preferable to a dug well, if the soil and general conditions permit of its adoption. Dug wells are practically underground reservoirs for receiving and storing water, which gathers too slowly to be pumped from its earth-bed direct by means of a tube-well pump. We do not propose to deal with the subject of boring for water, as this is work for a specialist, and scarcely comes within our province. The deep-dug well is practically the shallow well on a scale which involves increased work and expense. Borings are often made at the bottoms of dug wells, the object being to strike a water-bearing stratum, which will augment the supply already obtained. These deep strata hold the water under pressure, and when tapped the water rises up the boring. We have in mind one such well where the water rushed with great force up the pipe when the supply was tapped, and eventually came to rest 5 feet above the surrounding ground-level. It sometimes happens that the boring is started from the earth-level, and when water is struck in sufficient volume its highest level is taken, and a well is dug to a depth sufficient to admit of the pumps being fixed within a few feet of the water. Ordinary pumps, of course, cannot be fixed in a borehole, which has to be lined with iron tube if it passes through soft earth or any friable stratum. Dug wells, on the other hand, are lined partly to obviate falling in, and sometimes to prevent the top-ground water, which is of less purity, from percolating into the well.

Well-work presents two distinct operations—sinking, which is simply the dig-

ging of a circular hole, and steining, which is the more important work of lining the cavity. Steining needs to be done carefully when loose soils are encountered, while with hard chalk or rock the steining is dispensed with unless there is any likelihood of doubtful water entering through fissures near the top. Whenever steining is necessary it should be done as the digging progresses, otherwise the walls of the well may cave in.

Perhaps the commonest method of sinking and steining a well is by the use of a drum-curb. This may be of wood or iron, and consists of a flat ring to support the steining and a vertical cylinder or drum beneath it. The outside of the drum and ring are of the diameter of the finished excavation. Thus, for a 4-foot well with 9-inch brickwork the ring would be 5 feet 6 inches diameter. The rings or ribs may be of hardwood, two 1½-inch thicknesses by 9-inch wide, with a breaking joint. The outside plank can be 1-inch floorboards for wells up to 5 feet diameter. Some well-sinkers prefer to bevel the bottom edge of the drum, as illustrated, a precaution which others, however, do not consider necessary. If the soil is not very loose the side boards or staves need not be close together. In large curbs the rings may be about 3 feet apart and the drum 10 feet high, but for smaller purposes a 6 feet depth is ample, with three rings.

After the well has been dug to a depth which appears to be the limit of safety, without risking falls of earth, the drum-curb is lowered to the bottom and the steining is begun on its upper ring. The bricklaying has to be done in regular courses so as to equalise the weight all round the ring, for this is practically the only available means of giving the well plumb walls. As the brickwork increases in height its weight commences to exert a pressure on the curb, and tends to drive it down into the earth. To further this object the curb is often lined inside with loose bricks resting on the other

rings, these adding weight and increasing pressure.

When the well is steined as far as possible above the curb, earth is removed from beneath the lower edge of the loaded drum, which slowly descends. More brickwork is added to the top, the object being to assist the curb in its downward movement. It often happens, however, that the curb in a well of fair depth becomes "earth fast." If this occurs and the well has to go lower than the level found, a new sinking becomes necessary in the bottom of this finished portion of a sufficiently less diameter to admit of another and smaller curb being used. The second operation, in fact, is that of sinking a well at the bottom of a well.

In another method the ring is used without the drum portion. The ring being of iron or of oak or elm, 3 inches to 4 inches thick. When the excavation is as deep as is safe without the steining this ring is lowered, the brickwork built on it and completed to the top. The excavation is again proceeded with, but only to the diameter of the inner edge of the ring. Recesses are next cut in the earth-wall beneath the ring and brickwork carried up: these form a series of brick piers around the excavation, and the intervening earth is afterwards dug away and the brickwork between the piers completed.

The steining or lining of wells can be done with brickwork, iron, or large earthenware tubes, which can now be obtained. Brickwork is usual, and in stiff clay $4\frac{1}{2}$ inches is considered sufficient. It is, however, a good plan to put in 9-inch work with all wells up to 6 feet diameter, two separate courses of $4\frac{1}{2}$ -inch work, set in cement, and lined with cement. A much too common practice exists of steining with dry bricks—i.e., without mortar or cement. Bricks stacked up in this way may serve to prevent the walls falling in, but it is now generally recognised that the sides of wells should be watertight, if not to the bottom, at least down to a point where the water is invariably good. Below that level loose bricks might be used. Uncemented work would be per-

missible in wells having to go deep enough to pass two or three springs or water-bearing levels before a sufficient supply is obtained, when such sources are of good quality but limited in quantity.

To secure water-tightness two rings of $4\frac{1}{2}$ -inch work may be set in cement, but it is customary also either to cement the inner face of the work or to puddle behind it with clay. The stone lid also may be cemented down, but strong advocates for watertight wells (except at the bottom) argue that the well-walls should be built up a little above ground-level and then domed over and covered, so that by no chance will surface-water or land-washings get in.

With wells exceeding from 25 feet to 28 feet in depth, which, therefore, require the pumps to be fixed below the ground-line there must be stages, or suitable brackets for stages, built in at every 10 feet to 12 feet. These are to support the rising main, also to carry the rod-guides or rollers. These will be noticed again when illustrating deep-well pumps.

PUMPS.

A lift-pump, or the lifting part of a lift-and-force pump, relies for its action (its ability to raise water) on the pressure of the atmosphere—this, and nothing else. What may be termed a normal atmosphere supports the mercury column in a barometer at 30 inches, and this corresponds with an atmospheric pressure of 14.73lb., or $14\frac{3}{4}$ lb. to the square inch. In other words, the average pressure of the atmosphere on the surface of the earth is $14\frac{3}{4}$ lbs. to the square inch. To simplify calculations, 15lbs. to the square inch is usually mentioned. To understand the action of a lift-pump, it must be clearly realised that the pressure of air is exerted on everything on the earth. When this fact has been grasped the next step is to calculate what quantity of water is represented by the weight. What quantity of water could $14\frac{3}{4}$ lbs. to the square inch raise if there was nothing to prevent it? Keeping to the square-inch measurement, it will be found that a column of water 1 inch square and 2 feet 4 inches

high, weighs 1lb., and therefore a column just over 34 feet high weighs 14½lb. If we have a perpendicular tube 34 feet high, dipping at one end and closed at the other, and then by some means we extract the air from inside, the atmosphere will press upon the water and force it into the tube, and if a perfect vacuum has been formed, the water will rise up the tube to the full 34 feet. To create this vacuum we place a pump on the top of the pipe. The raising and depressing of the pump-handle causes the bucket within the barrel to fall and rise alternately, which action lifts the contents of the tube. If the tube only contains air, then each stroke of the handle causes the bucket to lift air, and by continuous working the whole of the air in the tube is raised and discharged through the pump body. During this time the apparatus is practically an exhaust-air pump. After each stroke of the pump, however, water rises in the tube corresponding in cubic quantity to the amount of air pumped out. If the length of the barrel through which the bucket moves holds a quart, then each stroke will theoretically exhaust a quart of air from the tube, and its place becomes filled with an equal quantity of water. In other words, a vacuum has been formed by the pumping action, and this has been filled with water by the atmosphere pressing on the surface of the water in the well. When sufficient strokes have been made the whole of the air has been drawn from the tube and the water rises in it until it reaches the pump, when the bucket begins to lift and discharge the water. To many of our readers this explanation of the pump's principle will be stale, but in writing this series of articles we have had in our mind the many younger men who are striving to add to their store of technical knowledge. If everything is perfectly sound and tight at the flanges and valves and between the bucket and the barrel-wall, the tube will remain full of water when the pump is at rest. The pressure of the atmosphere will hold the column of water up in the tube indefinitely of water when the pump is at rest. The pressure of the atmosphere will

hold the water up in the tube indefinitely if the pressure is exerted at the bottom end only, but if there is a leak at top, in the pump, or in the tube, then the column of fall when pumping ceases. beov qamfwd water will fall when pumping ceases. This is the explanation of the fact that a pump which has become worn and needs repair requires to be worked several strokes before water is drawn.

To close this explanation, we may now consider what would happen if the tube exceeded 34 feet in length between the water-level and the pump. The pumping would exhaust the air, and the water would rise in the tube as stated, and as the height of the water column is wholly due to the atmospheric pressure, the height is limited to 34 feet above the water-level in the well. Having thus explained what a pump should do, we may now remark that no pump will do the duty fully. It is the old story of Theory v. Practice, and when we get down to practice we find that water cannot be advantageously raised in this way more than 28 feet, while some authorities consider that 25 feet should not be exceeded. We incline to the latter, because in regular practice it admits of the pump working when it is a little worn. Of course, the inner parts of a pump (the leathers) can be renewed when worn, but no one wishes to do this oftener than necessary, and it must be admitted that just before the repairs become needful the pump works the easiest. When it can be done the pump should be put nearer to the water than 25 feet, and when it has to be put down the well it should be fixed at about 10 feet above the water. In wells where the water-level is lowered after pumping, the pump is placed nearer the water-line than that, and in some instances (mostly large works) it may have to be submerged.

In conclusion, when measuring up for a lift-pump it should be borne in mind that the 25 feet is a vertical measurement, and has nothing to do with horizontal pipes, which may be run as convenient, as, for instance, from the well in the yard to the scullery in the house.

Poultry.

ANCONAS AS EGG PRODUCERS.

IN the *Agricultural Gazette*, N.S.W., Mr. G. Bradshaw writes:—As previously said, poultry are kept for one or two purposes, or both. The primary object, however, is and always has been with the idea of making money, it being generally accepted that after purchasing the proper food for a fowl or fowls and supplying it in suitable quantities, coupled with other intelligent management, this fowl or fowls will give in return a quantity of eggs per week, month, or year, which, when put in the market, will realise sufficient to pay for the food and labour and leave a surplus for the owner. This has been briefly termed poultry keeping for eggs. Another branch of the business frequently associated with this is rearing chickens for the market, many people such as suburban residents, fruit growers, and farmers, who keep many or few fowls as a sort of auxiliary to their other business or trade, breeding both for eggs and meat. In the spring months eggs are usually the cheapest, and this is the best time for breeding and rearing for the market. For this purpose certain breeds of fowls are more suitable than others, but as previously stated, laying is not so much a matter of breed as of strain; on the other hand, certain breeds are much more profitable than others when carcasses for market is the object. Breeding for eggs, or egg farming, is practised by a great many in this State. These people may be called specialists from the fact that they make this the sole object of their operations, and in the majority of cases it is the most remunerative branch of poultry keeping. Some of these breeders keep one or two varieties of pure-bred fowls, others have some special cross from which they get satisfactory results, but all try for and the majority accomplish the production of eggs all the year round, for, as is too well known, while any old hen will lay in the spring when eggs are cheap, the majority cease producing when eggs are

at their dearest. Egg farming, as a rule, when practised on intelligent lines, pays better than when breeding chickens are included in the business, the chief reason being that the returns are much quicker, for as soon as the eggs are produced they can be marketed, in fact the shorter the time from the point of laying till marketed the better, new-laid eggs always being sought after in greater quantities than they can be supplied, whereas if chickens are hatched they require some months to feed, care and trouble—if reared at all—before they be brought to market. A good hen will lay a dozen eggs in a fortnight, worth 1s., while an ordinary chicken is only worth that amount at the end of about a couple of months or more, and during that time will have eaten as much food as it took to produce the eggs, together with other expenses, care and trouble, and the owner lying out of his capital for the longer period. This brings me to the crux of the question: To which of these branches of poultry-keeping are Anconas most suited? From the experience of the numerous English and local breeders there cannot be much difficulty in arriving at a decision, every reference to the breed pointing to its one special feature—that of being generous egg-producers.

The earliest mention of them is that they belong to the Spanish race of fowls, and more than a hundred years ago this race had the credit of being wonderful layers, and a table published in the *English Agricultural Gazette*, as far back as 1852, gives details of four birds of this breed, hatched on April 10, which commenced to lay on December 7, and produced for the twelve months 928 eggs, or 232 for each hen, a record which if correct puts in the shade any of our present-day breeds or strains. In 1854 Martin Doyle concludes his description of this breed by saying:—"They possess the general characteristics of the Spanish

race, and are excellent layers." In 1868 they are described by John Baily as being prolific layers, and to produce unusually large eggs. Another writer of the same period stated that they were very hardy and with no end to their laying. The next record is that attaching to those imported by Captain Rowle, the same generous laying attribute still attaching to the breed, which brings us down to the Anconas of modern times. The several English writers' testimony, which appeared in the previous portion of this article, that the characteristics attached to the Spanish race of fowls a hundred years ago has remained unimpaired in the Anconas until the present day is confirmed by modern writers, who specially mention them as excellent layers.

It may, however, be protested that the attributes for which the breed is celebrated may be largely due to environment or climatic conditions, and while doing well, as has been shown in En land, they may be a failure, or partially so, in this country. The evidence, however, is satisfactory. At Greta, 130 miles north of Sydney, the importer there has stated that with him Anconas are very good layers of fine white eggs, over the average size, and much larger than the Orpingtons. At Penrith they averaged 165 eggs a year per hen, not the laying of one hen, which is a very different matter, for among a flock of admittedly bad layers of any breed there may be an individual capable of the above record, but when a flock of hens lay over thirteen dozen eggs each in the twelve months, their value becomes apparent to the poultry-breeder who makes this the principal branch of his operations.

During the year in question, eggs averaged over 1s. a dozen all the year round, this revenue of 13s. each from a yard of hens being the most eloquent evidence in favour of the belated hen. In connection with these articles, I had purposed going lengthily into the various methods and cost of feeding fowls in relation to egg-production, but as other and not less important breeds await treatment, I must defer the feed question

for future extended reference, except at present to say that people need not run away with the idea that the above 13s. is all profit, the food bill for a year such as this is a big item in reducing the profits from any kind of stock. In normal years a hen's keep is approximately 1d. a week, or say 4s. for the twelve months, and, as is too well known, the present year the above food account will have to be doubled, which would leave about 5s. a year profit on each hen; this, however, will be increased by the fact that the present year's average for eggs will be considerably above the normal. Reverting to the Anconas, an importer at Moss Vale, with conditions, temperatures, etc., totally differing from those up north, says: "I have found them excellent layers, particularly towards the end of winter." Another breeder in the same district says they are good layers of very large eggs, three of the hens laying larger eggs than minoreas. The Victorian (Gippsland) correspondent, Mr. J. F. Travers, has had a similar experience, as follows:—"I brought the Anconas out with me from England now nearly two years ago, and have found them excellent layers. The chickens are very hardy and precocious, and learn to look after themselves at a very early age; the majority I have reared in foster mothers. The birds are certainly wild but soon get to know the person who tends them, and are quite tame with them, but if a stranger goes amongst them they are easily scared. The eggs are scarcely so large as those of some other breeds, but are not small. The demand for the birds and eggs so far has not been very large, but it is improving, and their great laying qualities should soon bring them to the front."

The above opinions are overwhelmingly conclusive that, unlike some of the other breeds, Anconas are to-day celebrated for the very same properties for which they were distinguished nearly a century ago, and, whatever may result in the future, there is no evidence so far that actually bad-laying strains have developed, and this, despite the fact that, of the two lots of this breed which competed at the College, one was low in the

contest, still they were two pens ahead of the celebrated Minorcas, one of Andalusians, and one each of Wyandottes and Orpingtons, and as the competition is being continued for a further term, the full year's record will be of much interest to those mfw iwa brbgk hrda drl terest as showing how they come out in winter production, as is claimed for them by several patrons. At the same time, there is a fear evinced that Anconas may go the way of many other breeds, namely, deteriorate in useful qualities. The following extract on this subject by Mr. E. Cobb, an English poultry expert, is taken from the second edition of *Profitable Poultry*, which may be had on application to the Department of Agriculture: "Those who launch the Ancona as an exhibition fowl will only have themselves to blame if in years to come it has lost that for which it is now recommended; but being launched, and and having taken the hold that it has on the fancy, I am of opinion that it will pay the fancier more profit if it only lays one hundred instead of as at present two hundred eggs a year, and that by the time this does happen another breed will be found to take the utility place vacated by the Ancona." That this danger is apprehended by some of our own breeders will be seen from Mr. Lurcock's communication, which concludes with the following: "I think when they become more generally known they will be more sought after as a utility fowl, that is, if breeders do not sacrifice their utility qualities for show points, which I do not intend to do."

Prior to the introduction of this breed to Australia it was generally understood that as the fowls were small the eggs were naturally so. Such idea has, however, with many others, received a rude shock by the result of the six months' contest at the College. Of the forty-one pens competing there were two of Anconas, both owned by breeders who have contributed their experience to this article. One of the pens finished sixth in the competition, leaving thirty-five pens behind; but more remarkable, the 444 eggs laid by these smallish fowls were heavier than the 451 laid by Buff

Orpingtons and 469 laid by White Leghorns, and thus secured the third prize for the greatest weight of eggs, the 444 weighing exactly 60lbs., the market value of which was £2 17s. 4d. The eggs from both pens in the competition weighed twenty-six ounces to the dozen, thus setting at rest all theories or opinions relative to size. I must now revert to a peculiarity of Anconas which is puzzling, and which with some poultry-keepers would be a rather severe handicap—I refer to the innate wildness of the breed, the majority of the old country breeders agreeing with those in Australia as to this peculiar trait. "Very wild," "Fly like magpies," "Scoot away on the approach of strangers," and other terms are used by various breeders, but all admit that with careful treatment they become as tame as any other breed, and particularly so with those who tend them. In conclusion, it will be seen from all the above testimonies and experiences that this variety of fowls are celebrated for egg production only—no end of laying, lay well in winter, and big eggs,—hence for those who make egg farming the principal branch of their poultry business this breed of fowls should be most satisfactory, and here it should be made clear that they must not be classed as meat-producers, being simply generous layers, hardy, and inexpensive to keep through being small feeders.

According to the *Lancet*, the substance known as Sericin, which forms 20 per cent. of mulberry silk and gives to silk material its peculiar and delightful character, has been formed by synthesis; and in this way an important step towards the artificial manufacture of silk has been made.

Neufchatel cheese is made by running buttermilk into a large tempering vat, where it is heated to a temperature of 120 deg. Fahrenheit. Let it remain quietly in this vat until the buttermilk has coagulated, and the casein settles at the bottom, when the whey is drawn off from the surface. The curd left in the bottom of the vat is put into a press, where the excess of moisture is expelled. It is then seasoned with salt and cumin, and if it appears dry, a little butter is added. The curd is then mixed thoroughly, and printed into small prints, which are wrapped with glazed paper, so as to prevent the escape of moisture. It is a cheap production, and sells well to the limit of the requirements of any market.

Shropshires.

THE following with regard to Shropshires in Australia and Natal will be read with interest in connection with the picture in this issue of three Shropshire shearlings :—

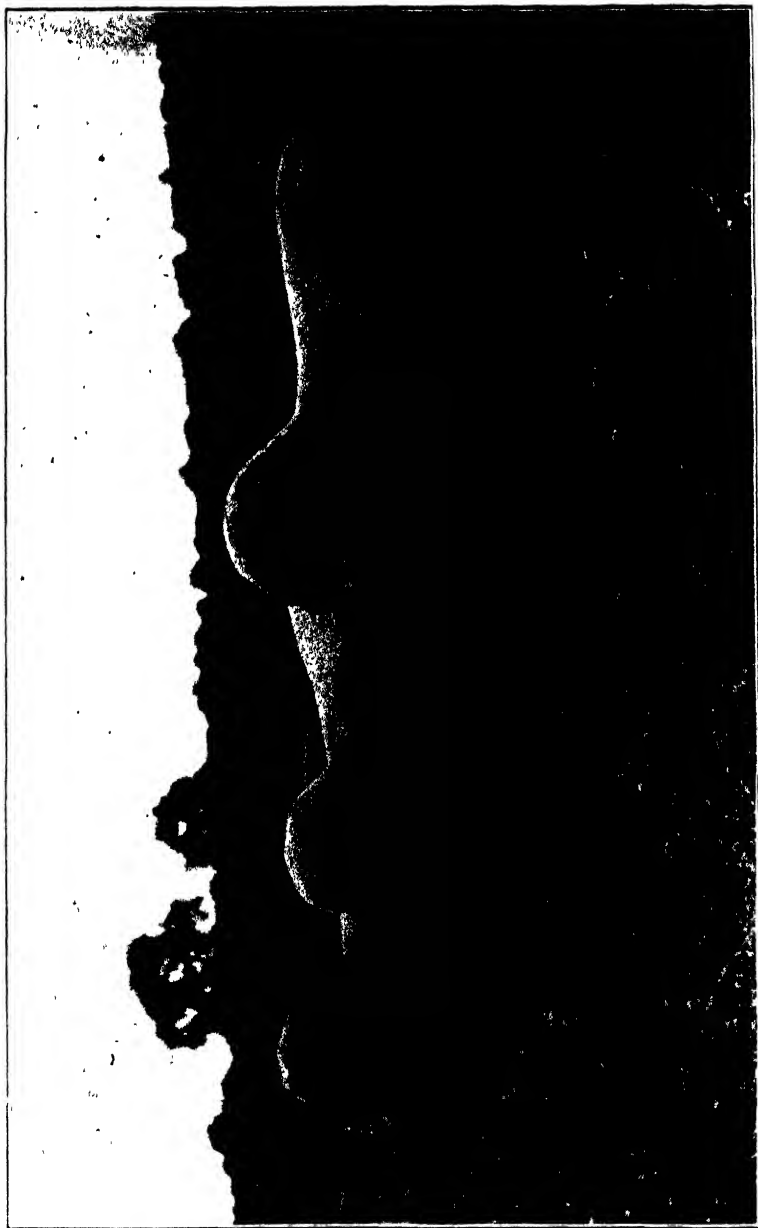
IN AUSTRALIA.

Shropshires were recognised as a distinct breed by the Royal Agricultural Society of England in 1853, when they were given separate classes, at the expense of the Hon. R. H. Clive, M.P. Since then their progress has been so great that in a late number of the *Field* it was stated :—"The Shropshire may be fairly described as the most popular breed in England. At the Royal and other shows it has made an excellent appearance, and the qualities which have recommended it at Home have made it famous in all parts of the world." This is no small praise, for it must be borne in mind that the Shropshire had to fight its way against the very finest mutton sheep in the world, all the breeds of which had been suited to their environment by many generations of breeding, and yet the Shropshire has won its way to favour in almost every part of England. My first introduction to the Shropshires was about fourteen years ago in New Zealand, where I found, to my surprise, farmers paying up to £9 per head at the distribution of a small flock. I was greatly taken with their handsome forms, and from what I then heard of them I formed the opinion they were the best sheep for Australian farmers, and all I have known of them since has confirmed this opinion. There is no rivalry between the Merino and the Shropshire; the latter is the farmers' sheep, the lamb-raisers' sheep, the sheep that will give the best returns where fodder crops are grown for feeding off. One of their greatest recommendations with many farmers is that their grades are unsurpassed for the market either for lamb or mutton, and they appear to cross equally well with long-wools, cross-breds, or Merinos. At the present day throughout Southern Australia, go where you

will, and where lambs are raised for the market, it will be found that fully three-fourths of them are Shropshire grades. They mature early, make excellent weights for the Home market, and the quality of the meat is all that could be desired. What further recommendation does a breed of sheep need that are hardy, mature early, are profitable for wool and meat, and withal so handsome that the flockmaster experiences a feeling of pleasure in looking at his stock?

One of the objections raised to the Shropshire is that the wool is of inferior quality. It certainly is of a different character to Merino wool, but it realises a fair price per lb., and the sheep cut a good weight. Mr. Weston is a firm believer in the wool-bearing qualities of the Shropshire. He says :—"About their being good wool-producers there cannot be any doubt; the grades, too, produce a profitable fleece." A few two-tooths at Kadlunga this year cut from 8 lb. to 10 lb. of light-conditioned wool, eleven months' growth. The stud ewes, from two to five years old, average fully 9 lb. The ewes' fleece went as high as 13½ lb., and the rams 14½ lb. Seven yearling rams, bred at Kadlunga, and sold to Mr. S. S. Ralli, Werocata, two years back, averaged exactly 12 lb. of wool of a year's growth. At the Adelaide sales, held late in October, Shropshire fleece sold at 12d. per lb. In 1895 it realised 9½d. per lb., which was the top price for greasy wool that season. In order to test the hardihood of the Shropshire, Mr. Weston, about three years ago, persuaded a friend living near Broken Hill to try a few for raising lambs for market. The last three seasons have been as bad on the Barrier country as they well could be; nevertheless the experiment proved a success. The Shropshire rams got a larger percentage of lambs than the Merino rams, and the lambs sold off at a good figure. Mr. S. S. Ralli found that in the worst of the drought, when he was losing many Merinos, the Shropshire and their grades came through without

SHROPSHIRE SHEARING EWES



PROPERTY OF PROPRIETORS OF COOPER'S DIP.

First Prize, Royal Show, 1898

By the Courtesy of Messrs. Wm. Cooper and Nephews

loss. The Shropshire is one of the few breeds of sheep in England which is valued for its wool-bearing qualities, almost as much as for the quality of its mutton. There is a danger that the favour in which the Shropshire is now held will be detrimental to the breed. Shropshire flocks are springing up in great numbers, and a considerable number of the sheep now paraded as Shropshires are merely cross-breeds, with dark legs and faces. The produce of these sheep are sold as Shropshires, and their use will likely tend to bring the breed into disfavour, for they have no good qualities to recommend them. Fortunately Shropshire flock books have been established in South Australia, Tasmania, and Victoria, and those who go into the market to buy Shropshires should be careful to see that the stock they secure have a certificate of caste.—*Australasian*.

IN NATAL.

The following is taken from an "interview" with Mr. P. D. Simmons, Mooi River, by "Ergates":—

"How about your sheep?"

"For four years I farmed Merinos, but the results were indifferent. I then came to realise the fact that improvement in wool would not be so paying as getting a considerable increase in meat. By going in for Shropshires I can safely say that I have raised the value of my sheep 10s. a head all round. I find them hardier, more tractable, and more contented in disposition. My wethers I never experience any difficulty in selling at 35s.; from four-tooth upwards they all run over 60 lbs. On one occasion I sold a pen of wethers at 50s. each."

"What is the best time for lambing?"

"For this District the month of July, in my opinion. Those lambs get a good start before the rough cold rains of September. Of course there is always a good bite of grass in this district at the beginning of September, but the ewes, if they have not been fed, have by then run down low in condition, and if the September should be a wet and cold one as the last has been, the chances of a good crop of them are poor. As you

know, most people in this district have their lambing in the month of September, and their losses this year have been enormous. Shropshires give less trouble than Merinos. Mine lamb in the veld, and are then—July—put on the cultivated grasses. I also wean the lambs on those grasses. The Shropshire is compact and symmetrical, and he is the best for wool of a Down type. Up to two years ago I got as good a price for my wool as the growers of the best Merino, but since then the cross-bred has sold at from 1d. to 1½d. less. The fleeces on the average go slightly over 5 lbs. I once experimented with an Oxford Down, but the result was too loose and angular for this country. Every year I have an increased demand for rams, and what is most satisfactory to me, the orders are generally repeated year after year. People are now buying rams from me who previously strongly believed that the Merino only was suitable for this country. By the way the serving works out at a very low cost if one goes in for a July as well as a September lambing. I use my rams twice, resting them and feeding them after the first service, and put them with the ewes again in April."

"Do your best lambs die much in January?"

"No: not now. The mortality among lambs in that month is, I believe, due to heat. You know how they get in clumps hanging down heads together when they cannot get shelter from the sun's rays. Well, in all my paddocks there are wattle plantations into which the sheep can and do go to escape from the rays of the sun. A drawback to the trees is the falling off of dead bark, which gets into the wool of a Shropshire—a disadvantage in this respect when compared with the close wool of a Merino. I also dose the lambs with opening medicine, and follow it with a tonic. In the licks I give sulphate of iron, also sulphur and lime."

At the accession of George III. (1760) meat was 3½d. a pound, cheese the same but'er, 6d., wheat under 30s. per quarter (8 bushels), and cottage rent 20s. to 25s. per annum, with a share of the common for cow, pig, poultry, and fuel.

Correspondence.

To the Editor *Agricultural Journal*.

PRUNING.

DEAR SIR,—I have read with great interest Mr. T. R. Sim's article on the pruning and non-pruning of fruit trees. I take it that he quite confirms my opinion that, from a marketable point of view, pruning is a necessity. I have also to thank Mr. W. Lister for backing up my letter on the same subject.

I have seen a good many orchards during the time that I have been in this Colony, and the result of what I have seen is that both farmers and orchardists having in the past planted out their fruit trees, as they thought, far enough apart at the time, quite forgot that trees are in the habit of growing, and then wonder after a few years how it is that the trees are so thick and crowded, although they appeared to be so far apart when freshly planted, and as the trees are neither pruned, manured, nor taken care of in any way, the owners

also wonder why there is so small a quantity of fruit. I am pretty certain that neither our American or Australian cousins would go in for systematic pruning if it did not pay to do so. And I am further quite sure that if fruit trees were more attended to at present than they have been in the past in this Colony there would be less fungi and insect pests attacking the trees. From what I can see of it, fruit trees are like children; if properly looked after and fed when young, they have more strength to withstand disease than if left to themselves.

In my letter to you, published in the *Journal* of March 6th, there is a slight mistake in my name. I suppose it was my fault for not writing plainly. I beg now to sign myself, yours truly,

J. H. SPENCE.

303, Greyling Street, Maritzburg.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give

services at first in return for board and instruction. Is interested in fruit growing.

No. 40a.—Aged 26, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barberton District of Transvaal. Is anxious to get work, irrespective to nature of employment.

No. 42a.—Englishman, 24 years of age. Has had life experience of agricultural, stock, and dairy farming in Cheshire, where he had the management of a farm, and gained several prizes for cheese-making. Is anxious to get on to a dairy farm, if possible.

No. 43a.—Is at present a student at the School of Agriculture, Kutt, near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.

No. 44.—Young lady of English parentage, who has had two years' training in poultry farming at Lady Warwick's Hostel, and who has also been at Reading College Poultry Farm, is open to accept an appointment for a year or two, where she will be able to acquire local experience of poultry farming.

Gleanings.

David Rankin, of Tarkio, Missouri (says the "St. Joe Journal"), who is one of the greatest corn raisers and feeders in the world, is credited with this saying: 'Thou shalt not sell corn.' His greatest success is attributed to his policy of never selling corn in any way except in beef or pork. Last year he received 150,000 dollars (£30,000) from the sale of his cattle, and 111,500 (£22,300) from that of his hogs.

Nearly 8s. per hen profit was made for the year ending 1st November by I. B. Koons, of Lehigh county, Pennsylvania, U.S.A., who started the year with thirty-eight Plymouth Rocks. They laid 4,118 eggs, which at an average of 11d. per dozen brought a little over £15. Chickens sold and used brought £4 15s., and the increase in the flock of forty-two head was valued at £4, making a total income of £23 15s. The expenses for feed were £10, leaving a net profit of £13 15s. 5d. During the year four fowls were lost through disease. This shows that fowls well cared for are profitable live stock.

A curious case of a disease being communicated from a fowl to a man is reported by Mr. W. F. Snell, the poultry expert to the Kent County Council. About three months ago a man bought a Plymouth Rock cock, which, after it had been in his possession for a few days, developed "white comb." He treated the bird by rubbing in a mixture with his hands, instead of with a brush. After a few days he discovered that he had apparently contracted the disease, for spots appeared on his face and at the back of his head, which became partially bald. Although the man has been treated by three doctors, nothing seems to arrest the progress of the disease.

The value of the exports of agricultural implements from the United States for the year which ended on June 30 (according to the *Farm Implement News*, was £3,257,350, as against £3,262,700 in the fiscal year 1901. This decline as compared with the previous year appears to indicate that this trade has reached its climax; however, as the difference in value of harvesting machinery, while ploughs, cultivators, and other implements show good increase, it may be but a temporary reaction in the demand for harvesting machines which will take a turn for the better next year. The value of these exports to Great Britain fell off considerably, and to Germany largely, but to France and other European countries there was a fair increase. British North America leads all countries in both amount and increase, exports of implements there having reached the value of £624,730, as against £425,400 in the previous year. The demand was less from the Latin-American countries generally, with the exception of Argentina.

On Derby day in old time Epsom Downs saw doings which would astonish modern race goers. Thus on one occasion, "between the heats," two gentlemen riding in the direct line of the course in opposite directions, the horses came in contact with such dreadful velocity that one was killed on the spot, and the other having his shoulder dislocated an end was put to his existence also.

A return by Herr Reichert, of Berlin, says that Great Britain should be aroused in the matter of forest-tree planting. She is now at nearly the bottom of the list which gives the proportion of forest land to the total area. The forests of Sweden and Russia are equal to 42 per cent. of the whole country; Austria, 31; Germany, 26; Norway and India, 25; France, 16; Portugal, 5; Great Britain and Ireland, 4; and Cape Colony, only 0.29 per cent. of the country.

In the Royal stables in Sweden, says a writer in the *Sporting Magazine* of 1803, the horses are allowed no litter, but stand on a raised floor composed of boards with open joints. This plan is common also in Norway and in Denmark, where cows and even pigs are housed on similar platforms. The animals are in this way easily kept clean and dry; and to this practice it is perhaps owing that in these northern countries a foundered horse is seldom to be seen. In the mode followed in other places the warm, humid compost of dung and litter seems to have the effect of making the feet tender and liable to disease. The Duke of York has, by way of experiment, directed some barrack stables to be constructed on the Swedish plan.

Says J. A. Nunn, vet. lieutenant-colonel:—"In the proper fitting of a saddle, the true secret of success is that the whole of the weight-bearing portion should accurately correspond to the surface of the back, or, in other words, that the whole of the weight-bearing surface should be utilised. A saddle cannot be put forward on the withers, or it will pin in, and interfere with the motion of the shoulder blades, causing the horse not only to go short and pottering, and to stumble, but also very likely cause abrasions on the sides and top of the withers from the points of the tree and gullet plate. Again, the saddle cannot be put far back on the loins, as the part is not adapted to carry weight, and the large propelling muscles would be interfered with. It, therefore, follows that there is a limited space in the length of the back available—a weight-bearing surface of about 22 in., and this is further reduced if we remember that it is only the flat surface of the rib between the back bone and curve that can be made available. If this is remembered, it can be realised how important it is that every available portion of the bar of the saddle should carry its due proportion of weight.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of March, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same per. from July 1st, 1901.
	Maximum.	Minimum.					Fail.	Day.		
Observatory ...	82.7	64.4	90.7	55.6	4.13	12	1.46	3rd	27.02	44.19
Stanger... ..	83.7	61.1	109	54	2.73	15	1.72	2nd	29.59	35.80
Verulam	87.5	65.2	104	55	2.74	10	1.38	2nd	25.03	30.04
Newcastle	84.0	53.5	91	46	.96	10	.47	31th	16.71	32.03
Ndwedwe	79.7	58.2	98	49	2.53	10	.71	8th	...	...
Estcourt	85.0	54.2	95	40	.74	3	.40	2nd	20.22	28.80
Port Shepstone ...	85.0	55.2	90	49	3.81	7	1.45	13th	...	44.61
Umzinto	85.0	64.8	94	53	3.46	7	1.41	19th	32.63	34.45
Richmond	80.9	54.8	96	40	3.27	13	.84	13 h	23.62	36.22
Maritzburg	83.6	...	99	...	2.31	11	.69	2nd	18.49	29.37
Howick... ..	81.8	53.6	96	40	1.93	14	.54	7th	16.43	28.57
Dundee... ..	81.5	55.0	93	44	1.66	8	.68	27th	17.12	30.54
Weenen	88.9	54.9	99	43	1.28	9	.52	1st	19.64	24.66
New Hanover	84.1	54.0	97	38	1.42	10	.45	19th	20.24	35.27
Mapumulo	86.6	53.2	1.4	48	1.44	5	.51	20th	25.06	...
Nongoma	79.4	59.6	90	50	.57	2	.45	8th	...	37.83
N'Kandhla	75.0	46.9	89	34	.94	3	.35	7th	...	...
Umlalazi	85.9	...	100	...	3.30	9	1.17	2nd	...	...
Hlabisa	90.5	70.4	95	63	.30	1	.30	9th	...	36.59
Melmoth	84.3	56.1	102	48	.94	8	.20	3rd	19.34	28.60
Eshowe... ..	81.2	60.5	98	52	2.76	9	.95	3rd	32.92	47.95
Point ... ..	...	...	...	...	4.31	14	1.39	2nd	...	30.88
Paulpietersburg ...	84.3	...	95	...	1.54	13	.85	28th	...	...
Nqutu	76.1	42.5	86	32	1.48	7	.55	29th	18.32	...
Mahlabatini	81.7	59.8	94	49	.73	5	.22	19th	...	...
Lower Tugela... ..	81.3	58.9	108	52	2.53	13	1.04	3rd	23.51	...
S. O. Junction ...	..	...	...	...	2.85	11	.65	3rd	22.80	43.66

OTHER STATIONS.

Estcourt ... ..	...	...	91	39	.69	8	.25	27th	20.69	29.39
Nottingham Road ...	...	...	...	...	3.46	11	1.23	1st	28.17	32.51
Adamshurst ... ..	...	...	97	48	2.34	10	.74	6th	17.71	30.17
Hilton ... ..	...	...	94	41	1.74	15	.29	19th	20.74	25.88
P.M.B., Town Bush	...	...	...	...	...	...	...	...	...	...
Valley ... ..	...	...	...	...	2.91	12	.67	2nd	29.11	...
Ixopo, Gorton ... ..	...	...	86	52	3.19	12	2.00	14th	...	20.30
Mid Illovo, Ismont ...	...	...	90	48	2.64	8	.79	3rd	...	39.23
Ottawa ... ..	...	...	...	...	2.15	7	.95	3rd	24.12	41.50
Mount Edgecombe ...	...	...	94	56	3.25	9	1.55	3rd	26.75	49.86
Cornubia ... ..	...	...	...	...	3.12	...	...	...	28.80	50.62
Milkwood Kraal ... ..	...	...	...	...	2.82	...	...	...	20.19	38.12
Blackburn ... ..	...	...	...	...	2.42	...	...	...	25.22	44.29
Saccharine ... ..	...	...	...	...	2.92	...	...	...	26.15	47.17
Prospect Hall... ..	...	...	...	...	2.90	...	...	...	23.67	36.87
Equeefa ... ..	...	...	98	58	2.49	9	.75	8th	27.23	39.53
Umzinto, Beneva ... ..	...	...	...	...	2.62	9	.82	7th	27.00	41.65
Central Ex. Farm ...	...	...	90	40	1.75	13	.53	3rd	...	...

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of March, 1903 :—

March, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised.	
	Above Ground.			Below Ground.						tons.	cwt.
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Dundee Coal...	15	15	173	14	129	525	2	18	27	10,515	15
Natal Navigation	20	58	154	16	323	80	2	...	...	9,397	8
Elands Laagte	9	9	142	10	126	245	6	38	5	8,056	11
St. George's ...	11	70	86	6	135	97	1	12	...	6,256	6
Glencoe ...	17	95	83	9	179	7	...	...	...	3,840	0
Natal Marine	7	63	8	7	145	4	...	...	...	3,440	0
Natal Steam Coal	...	...	.	2	130	2	1	20	8	2,048	11
No. 42 ..	6	19	12	2	95	...	...	...	...	1,622	4
Newcastle ...	4	12	11	4	90	2	...	...	...	1,549	18
Ramsay ..	3	20	11	3	46	34	2	16	11	1,473	5
Natal Merthyr	5	60	5	2	80	9	...	38	...	1,220	0
W. Lennoxton	2	5	12	2	20	35	...	4	4	1,209	13
Central ...	...	11	...	2	115	...	4	37	2	894	5
Crown ...	3	17	24	2	44	8	...	...	...	748	0
South African	9	24	...	4	82	3	...	71	5	472	0
Natal Victoria Navigation	1	32	4	2	63	2	2	33	1	230	10
Total ..	112	510	725	87	1,802	1,053	20	287	63	53,174	6
Corresponding month, '02	110	493	510	76	1,497	1,020	20	60	77	51,194	3

CHAS. J. GRAY, Commissioner of Mines.

9th April, 1903.

Return of Coal bunkered and exported at the Port of Durban for the month of March, 1903 :—

						tons. cwt.
*Bunker Coal	...	...	...	...	...	20,493 14
Exported to :—						
Cape Colony	...	...	...	...	...	26 4
Beira	...	...	...	...	...	...
Delagoa Bay	...	...	...	...	...	22 0
Total ...	...	...	...	...	...	21,541 18

* Included in this item is imported coal, viz. : 418 tons 19 cwts.

Custom House, Port Natal,
31st March, 1903.

GEO. MAYSTON,
Collector of Customs.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of March, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Mar. 1	Ornamental Plants ...	1 case	New York	Saxon Prince	Free of Pest.
" 6	Apples, Fresh ...	5,029 cases	Albany	Wilcannia	" "
" 9	Grapes ...	172 boxes	Cape Town	Briton	" "
" "	Apples ...	34 "	"	"	" "
" "	Ornamental Plants ...	1 case	London	Saxon Prince	" "
" "	Carnations ...	1 "	"	Kirkdale	" "
" 11	Apples ...	517 boxes	Sydney	Aberdeen	" "
" "	Lemons and Oranges ...	750 cases	Italy	Kron Prinz	Scale present and bad condition. Destroyed by burning.
" 24	Rose Trees ...	1 case	Southampton	Kildonan Castle	Free of Pest.
" 28	Grapes ...	6 boxes	"	"	" "
" 28	Apples ...	673 cases	Albany	Damascus	" "
" 30	" ...	1,070 "	Adelaide	Yarrowanga	" "
" "	Grapes ...	500 "	Southampton	Saxon	" "

Custom House, Durban, 4th April, 1903.

C. B. JONES, Examining Officer.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab " "	J. Zietsman ... M. Hattingh ... W. de Bathe ...	Snelster. Nokopela. Otterbush.
J. Button	Estcourt, South of Bushman's River	"	D. W. Mackay ...	Dalton.
J. J. Hodson ...	Lion's River ...	" " " " " " "	J. King ... C. Strapp ... J. & E. Parker ... E. Parkinson ... H. W. Wardale ... G. & B. Hutchinson P. D. Kimber W. Wilson ...	Lynedoch. Oatlands. Tetworth. Klipfontein Beverley. Boschfontein. Maritzdaal. Thornton House.
K. Soutar ...	Portion of Lion's River	"	F. Stanley ...	Nonpariel.
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe.
W. Wilton ...	Polela ...	"	J. Isbister ...	Buckquoy.
J. A. Trenor ...	Alfred ...	" " "	Mongola, Guveel, Qupass, and Ntokolo }	Location.
A. H. Ball ...	Wenen ...	" " "	J. P. Lotter ... T. Hair ... H. J. Vandermerwe	Berg Vleit. Gretna Green. Exchange.
W. Gray	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
E. J. B. Hosking ...	Upper Umkomanzi	"	W. W. Johnson ...	Cottingham.
A. S. Parkinson ...	New Hanover ...	" "	Makenke & others Bongola & others }	Swazimana's Location.
C. J. Van Rooyen	Krantzkop ...	" " "	H. T. Van Rooyen Mrs. Nel ... J. P. Nel ...	Krantzkop. Ungegunt. Sweet Home.
R. J. Raw ...	Impendhle ...	" " "	J. B. Griffin ... C. P. Speirs ... W. M. Fisher ...	Kimberley. Mount Park. Myrtle Grove.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lung-sickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 44 herds of cattle under license for Lung sickness, and 14 flocks of sheep under license for Scab as under :—

Natal—Newcastle Division	...	...	2	for Lung sickness,	—	for Scab
Klip River	"	...	7	"	3	"
Dundee	"	...	2	"	4	"
Umsinga	"	...	3	"	2	"
Upper Tugela (North of Tugela River) Division	...	...	—	"	2	"
Utrecht District	...	...	1	"	—	"
Vryheid	"	...	9	"	—	"
Paulpietersburg	...	...	2	"	—	"
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni	...	...	2	"	1	"
Districts	...	...	8	"	2	"
Nkandhla and Ngutu Districts...	...	...	8	"	—	"
North of White Umfolosi and Umfolosi Rivers	...	...	—	"	—	"
Total	...	...	44		14	

The following farms are in quarantine for rinderpest :—

Krantzkop Division.—Amobonvu Location.

Estcourt Division.—Rossendale.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Ngutu District, Nkandhla District, Ndwandwe District, Nongomo District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 16th April, 1903.

Agricultural Shows.

Greytown, Thursday, 14th May. Entries close 25th April. President, A. Kohrs. W. H. Gibbs, Hon. Secretary.

Ixopo, Thursday, May 21st, 1903. Entries close with Hon. Secretary on Saturday, May 9th. Fred. Thompson, Hon. Secretary.

Bulwer, Thursday, 28th May. Entries close 9th May. President, J. F. Alexander. Hon. Secretary, A. Brown.

Estcourt, 3rd and 4th June, 1903. President, H. Blaker, J.P. E. Cauterley, Hon. Secretary.

Umzinto, Thursday, 18th June. Entries close 13th June. Hon. Acting Secretary, R. G. Archibald.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries (to be made to Messrs. Duff & Eadie, Assistant Secretaries, 19, Timber Street) close 4th June; late entries 11th June. President, Sir T. K. Murray, K.C.M.G. A. Whittle Herbert, Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President A. W. Cooper, J.P. Hon. Secretary, John Marwick.

New Hanover, Friday, 24th July. Entries close 11th July. T. B. Train, Secretary.

Mid-Illovo, Thursday, 5th August. Entries close 15th July; late entries 20th July. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 24th June. Secretary, W. E. Allsopp.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG, Messrs. W. H. Walker & Co. write :—There is nothing of importance to report regarding trade. Matters have now assumed such a peculiar aspect that one might be justified in saying that in many lines there is absolutely nothing doing. Unfortunately, this will be the burden of nearly all reports on trade matters, and especially will this apply to the produce trade. Some good

rains have fallen since our last report, especially in the neighbourhood of Cato Ridge, and in the vicinity of York and in some of the upper districts; but it is doubtful whether these late rains will materially benefit the crops.

Meatlies.—We are now entirely depending on imported grain for our daily supplies; and, as the market is constantly changing, it is too risky to give quotations. In fact, it is certain

America is the depôt from which the Colony will have to draw the bulk of her supplies for the next ten months.

Hay.—From 2s 9d to 5s 9d per 100 lbs; bedding, from 30s to 38s per load.

Forage.—From 5s 9d to 11s 1d per 100 lbs.

Peas.—From 9s 6d to 15s 6d per 100 lbs.

Beans.—From 20s to 21s per 100 lbs.

Onions.—From 8s. to 16s 9d per 100 lbs.

Tobacco.—From 4d. to 9d. per lb.

Potatoes.—Some samples were as low as 3s 9d, 4s, and 4s 9d per 100 lbs; better samples, however, realised from 10s to 12s 9d per 100 lbs. Sweet potatoes, 4s 9d to 5s per 100 lbs.

Geba.—Mabele and geba are now very scarce; the latter has realised about 10s 6d per 100 lbs.

Pumpkins.—From 3s 6d to 12s per 100 lbs.

Poultry.—Common fowls, from 9d to 3s each; trussed fowls, 2s 6d to 3s each; ducks, from 5s to 8s 9d per pair; geese, 6s 9d each; turkeys (cocks), 8s to 15s each; (hens), 8s 6d each.

Eggs.—From 2s 5d to 4s 5d per dozen.

Butter.—Fresh butter, from 1s to 2s 8d per lb; salt butter, 1s per lb.

Sundries.—Mutton, 5½d to 9d per lb; pork, 5d to 7½d per lb; sucking pigs, 5s to 8s 6d each; sugar cane, 6d to 1s per lot; suet, 3d per lb; and almost every morning coal is now sold.

Fruit.—Apples, bananas, guavas, grapes, limes, lemons, pears, pears (Avocada), peaches, pineapples, pomegranates. Several mornings a quantity of Cape fruit has realised good prices.

Vegetables.—Artichokes, beans, beetroot, brussels, cut cabbages, celery, lettuce, peas, tomatoes, radishes, rhubarb, have been disposed of.

Firewood.—From 4d. to 10½d per lb.

DURBAN, Mr. W. H. Edmonds, P.O. Box 44, writes:—

General.—Trade continues dull, and there is very little doing just now.

Mealies.—The small parcels of white North American grain now landing prove utterly inadequate for the demand, and were it not for a large shipment of South American whites just up the scarcity would be almost unprecedented. Quotations are very misleading, as holders can ask and obtain their prices. Meal is worth about 30s. per muid. The colonial crop is beyond all doubt a failure, and importation will be necessary for the next twelve months. Enormous supplies are reported to be on the water, and there is no fear but that stocks will not only be plentiful, but cheap also, in due course.

Potatoes.—Prices are very fair, and any good samples command 20s per muid readily. Blight is reported from various quarters.

Hay.—The incoming crop will be the smallest for many years. Some farmers report that the grass is so short as not to be worth cutting.

Forage.—Prices are very firm, and good qualities are worth 12s 6d 100lb. In view of the poor agricultural outlook, higher figures may be looked for.

JOHANNESBURG, Mr. W. H. Thomas, P.O. Box 1,960, writes:—Since my last report on our market, our prices have been considerably better. I cannot place it to any cause whatever for this change, unless it is to the fact of large dealers not caring about

importing for the present, until the duty comes off the Cape, O.R.C., Basutoland, and Rhodesian territories' produce, which takes effect on the 24th inst. Nothing is mentioned about Natal produce, and to all appearances this won't be reduced until July. The market prices were as follows for the week ending April 11th:—

Seed Barley, per 163lbs.—Very little has been coming on the market, and in spite of this, the prices were not high. From 19s 6d to 26s.

Green Barley for Forage, per 100 bundles.—This has been a little more plentiful this week and realising from 25s to 40s.

Bedding (dry grass) from 8s to 40s per load.

Bran.—There has been considerable demand for this line, principally colonial bran, which is very scarce, and imported wheat bran must take its place, selling from 11s to 11s 9d per 100lb bags.

Butter.—Fresh, from 1s to 1s 6d per lb.

Bales of Chaff.—There has been a considerable rise in this line, prices going up in a few days by 2s, prices ruling from 9s to 10s 6d per 100lbs.

Kafir Corn.—This is still very scarce, and in demand, good red corn ruling in price, viz., 32s to 33s; white, 30s to 32s per 203lb bags.

Oathay.—This has also advanced in the last few days, and very firm, now from 12s to 13s per 100lbs, very little coming forward.

Onions.—The prices have gone up well this week owing to the fact that there was not sufficient for the demand. Prices now are from 17s to 20s per 125lb bags.

Potatoes.—Same as onions, have also advanced. For local new as much as 36s have been realised. The prices now are, local new, 30s to 33s 6d; imported from Cape and outside districts, 19s to 28s per 163lb. bags, although the market was well supplied throughout the week.

Fowls, 2s 9d to 3s 6d, 4s to 5s 6d; ducks, 6s to 7s 6d; geese, 8s to 10s; turkey cocks, 15s to 20s; hens, 7s to 10s; local new eggs, 5s to 7s; imported and colonial eggs, 1s 6d to 3s.

The famous "Latakia" tobacco, known as "Abou-Riha," is so named from the district of Lattakia, in Syria, where the variety is principally grown. The chief peculiarity in its cultivation is that the plants, which are very closely planted, are hardly watered at all, and in the process of curing the leaves are made to absorb the fumes of the resinous and scented wood called 'Elozr.'

Some Canadian tests have gone to show that the Yorkshire breed of pigs has given more satisfaction than any other breed. They are very uniform, with practically no culls. (A large packing house is mentioned by the *American Agriculturist* as having reported to a large breeder of the white pigs that "the last shipment of hogs which you sent us is just out of salt. The sides, without exception, show a very satisfactory degree of firmness. Our inspector's report is that all the sides grade No. 1 with respect to hardness. Whatever your method of feeding has been in regard to these particular hogs, you have certainly discovered some system which gives very excellent results." The feed used was:—Barley, two parts; middlings, one part, by weight; with tares and vetches for green stuff.

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Araucarias.

By T. R. SIM, Conservator of Forests.

OF all the ornamental trees in cultivation, perhaps no small group is so largely used for producing striking scenic effect, especially in sub-tropical countries, as the genus *Araucaria*. It is not, however, confined to sub-tropical countries, for one species, *A. imbricata*, has been in cultivation in England since 1796, and is now widely cultivated, while its home in Chili is near the snowline. The more tender kinds are, however, better suited for the climate of Natal, and have proved themselves at home in it; and as the more coastward parts of

the Colony are found not well adapted for ordinary pine trees, and these *Araucarias* are the most likely substitutes for them for timber purposes, the following notes are supplied with a view to giving encouragement to the planting of kinds found suitable, and warning with regard to the others.

The natural habit of all the *Araucarias* is to produce a more or less distinct whorl of branches once a year, with a season's growth of clear stem in each case separating these whorls. This gives the tree a regular and formal appear-

ance, which, combined with its graceful outline, places it easily as the best tree for a central single specimen on a lawn or other open space in which there is room enough to show its form to advantage. For twenty or thirty years it maintains its graceful individuality, when in good health, but beyond that age it is apt to lose the lower branches and become less graceful. On the Coast the tender kinds have the further qualification of standing Coast winds, resisting the attacks of white ant, and growing to maturity better than almost any other class of exotic timber trees while in economic value as timber producers they bring with them first rate recommendations from their natural habitats, which there is every reason to expect will be found justified here when there are trees to spare for cutting up. The difficulty in getting up stock has hitherto been the scarcity of locally grown seed, and the poor germination usually obtained with imported seed, in many cases less than one in a thousand germinating. This is now being overcome to a considerable extent from the crops yielded of several kinds by the oldest trees in the Durban Botanic Garden, seedlings in thousands being produced from these. Many trees of several of the species are doing well throughout lower Natal, but most of these are less than 20 years of age. The trees in the Durban Botanic Garden are among the oldest in the Colony, and therefore are of special value as showing what may be expected of each kind when more matured, though, of course, the number of old trees is small. Mr. J. Medley Wood, A.L.S., the Curator of that Garden, in his last annual report, gives interesting information concerning the local growth of the different species, and remarks generally:—"In my annual report for 1899 I noted that the largest trees of *Araucaria excelsa*, which were planted in 1867, and are now, therefore, 35 years old, were dying out from the top; these trees still show signs of life, but are very gradually dying, while trees of *A. Cunninghamii*, *A. Bidwillii*, and *A. Cookii* planted at the same time and in close proximity to *A. excelsa* are still vigorous. Of these I prefer the two last

named, as they seem to be more suited to the Colony, or, at any rate, to our part of it than *A. excelsa*, and *A. Cunninghamii* seems to be more subject to blight than the others. From what I have seen of them I can safely recommend them, specially *A. Bidwillii* and *A. Cookii*, as suitable to grow for timber."

The species in cultivation are:—

1. *Araucaria Bidwillii*, Hook; the Bunya-bunya. This species, which is a native of the mountains of Queensland, in the neighbourhood of Brisbane and Moreton Bay, latitude 25 degs. to 28 degs. (equal to Swaziland), was introduced into England in 1840, but is not hardy enough to stand the winter there outdoors. Concerning its growth in Natal, Mr. Wood states, "Our tree, which was planted in 1867, is now 60 feet in height, and 7 feet in girth at 6 feet from the ground, and is quite healthy. The late Baron Von Mueller says concerning it: "A tree attaining 250 feet in height, with a fine-grained, hard and durable wood, particularly valuable for furniture; it shows its beautiful streaks best when polished. The seeds are large and edible. Growth in height at Port Phillip 30 to 40 feet in 20 years, the big strobiles, ripening there." Maiden, who is the recognised authority on Australian economic products, endorses the description of the wood, and adds a report as under by Ransome on a specimen sent to the Colonial and Indian Exhibition, viz.: "This is a straight-grained, light-coloured, mild-working wood, often prettily marked. Judging by the experiments, it should make excellent framing, and as it plains well it could be used for common furniture, as it is not inclined to warp or twist." Maiden also states that it is not allowed by the Government to be felled on Crown Lands owing to its seed yielding an article of food to the Aborigines, who congregate from great distances to partake of the crop. Height, 100 to 150 feet; diameter, 30 to 48 inches. In the Cape Colony its culture is not regularly successful.

2. *Araucaria Brasiliensis*, Rich. From Southern Brazil, 15 degs. to 25 degs., and the Argentine Republic. A tree

reaching a height of 180 feet in its native forests, where it grows in pure forests of the one kind. Its timber is used for boards, masts, spars, etc., and the bark yields turpentine. Several trees in Cape Colony have failed; its success here has still to be proved. Its failure appears to be due rather to drought than to cold.

3. *Araucaria Cookii*, Brown. From the Isle of Pines, New Caledonia, and the New Hebrides, latitude 15 degs. to 25 degs. Concerning this species, Mr. Wood states: "The tree of *A. Cookii*, planted at the same time as the others (1867), is now 90 feet in height and 6 feet in girth at 6 feet from the base." In the "Guide to the Garden" he states: "In age this tree has a somewhat curious habit, shedding its branches for five-sixths or more of its length, replacing them by a smaller and more bushy growth, so that the tree at a distance presents a very columnar appearance, the resemblance being increased by the summit being crowned by a mass of foliage somewhat like a capital." Hence the name *A. columnaris* sometimes applied to it. Mueller gives its technical value as similar to *A. excelsa*, and its growth at Port Phillip at not quite 30 feet in 20 years. The growth recorded from Durban is nearly twice that, and many younger trees are doing well in Natal up to about 4,000 feet altitude. Probably the best species for planting in Coast districts, especially in Zululand.

4. *Araucaria Cunninghamii*, Ait. The Moreton Bay Pine, from Queensland, New South Wales, and New Guinea. Cunningham, who first pointed out its difference from *A. excelsa* in 1824, states: "On the coast of New South Wales it has a range of 900 miles between the parallels of 14 degs. and 29½ degs., but in no part, whether on the islands or in the offing, on many of which it is the only timber, or on the main shore, has it been remarked of large size, rather appearing of a stunted, irregular growth, and frequently broken down by the force of the prevailing winds. On the alluvial brushy banks, however, of the Brisbane River, between latitude 27 degs. and 30 degs., where it is perfectly sheltered from every blast,

it rises to the height of from 100 to 130 feet, with a girth of from 14 to 16 feet, or even more; and such specimens are frequently to be met with having a clear, smooth, cylindrical barrel, 80 feet in height from the ground to the lowest branches. In my several geographical excursions in the highly interesting country lying to the westward of Moreton Bay I met with this pine at some distance from the banks of the Brisbane River, as also on the hills on the western side of the dividing range, in latitude 28 degs., at a distance from the coast of about 80 miles, beyond which, however, in any inland or western direction it certainly does not exist. Its maximum, therefore, is evidently on the immediate coast, within the influence of the sea air, which, however, is not so essential to its existence as it appears to be for some of the plants I had discovered during Capt. King's voyage. Its wood is a pale yellowish deal, and is commonly used in house carpentry for making common furniture, and in boat building at Brisbane. In the green state its spars have been formed into masts for vessels of 200 tons, which are said to stand as long as the sap continues in them, but after they become dry they are not to be depended on." Muller states: "The tree attains a height of 200 feet, with a trunk of 6 feet in diameter. Growth at Port Phillip 30 to 40 feet in 20 years. The timber is fine grained, strong and durable, if not exposed to alternately dry and wet influences; it is susceptible of a high polish, and thus competes with satinwood, and in some respects with birds-eye maple. Value in Brisbane, £2 15s. to £3 10s. per 1,000 superficial feet. The tree grows on the alluvial banks as well as on rugged mountains, overtopping all other trees. The resin which exudes from it has almost the transparency and whiteness of crystal, and is often pendent in the shape of icicles, which are sometimes 3 feet long and 6 to 12 inches broad." Ransome reported on the sample submitted to him: "This is rather harder and better wood than the last mentioned (*A. Bidwillii*). It is of a light colour, with a straight grain, and planes very smooth with a rapid feed." Maiden mentions

that the timber from the mountains is preferred to that from the coast flats; that it attains a height of 150 to 200 feet; diameter, 36 to 66 inches; that it yields spars 80 to 100 feet long, and that one tree has been known to yield 10,000 feet of timber. He says: "It is pale coloured and extensively used for flooring and lining boards, also for punt bottoms when kept constantly wet." He gives the weight per cubic foot of dry timber as 30 to 33 lbs. On this species, Mr. Wood remarks: Our tree planted at the same time as *A. Bidwillii* (1867) is now 90 feet in height and 5 feet in girth at 6 feet from the base." This is the tree of which an illustration will be found in this number. A good many younger trees are now growing in Natal.

5. *Araucaria excelsa*, R. Br. The Norfolk Island Pine. This is the most widely known sub-tropical *Araucaria*, having been introduced into England in 1796, where it is largely employed for conservatory decoration; it is also found capable of standing a certain amount of frost, down to a temperature of about 14 degs. Fahr. Its natural home is on Norfolk Island and on the Australian east coast, but it is now in cultivation in all suitable climates, usually represented by only a few specimens on account of the difficulty of procuring seed. In Cape Colony fine trees are standing in Cape Town, Port Elizabeth, East London, Grahamstown, and Kinwilliamstown, the Coast trees being fully exposed to the sea wind, though not near enough to receive sea spray. In Natal also good young trees are not uncommon. Mr. Wood remarks on the largest trees, 35 years old, beginning now to show signs of dying out, and adds: "Our tree, planted at the same time as *A. Bidwillii* (1867), is now 80 feet in height and 3 feet 9 inches in girth at 5 feet from the base."

The first trees of this species, discovered by Captain Cook in New Caledonia, were on islands which are mere sand-banks. He found the timber white, close-grained, tough, and light, and the trees growing to 200 feet in height and 14 feet in girth. Some have since been found up to 30 feet in girth, and clear of branches for 40 to 60 feet. Captain

Hunter, who afterwards collected trial logs for navy purposes, found a large proportion of the trees defective, which, considering the exposure in which they grow, is hardly to be wondered at. He adds: "It is a very short-grained and spongy kind of timber, and I think fit only for housebuilding, for which we know it to be very useful. When first cut down five out of six will sink in water; the wood is exceedingly heavy." (This evidently refers to fresh wood as it becomes light when dry.) On this species Mueller remarks: "A magnificent tree of unsurpassed symmetry, sometimes 220 feet high, with a stem attaining 10 feet in diameter, and with regular tiers of absolutely horizontal branches, one for each year. The timber is useful for shipbuilding and many other purposes. Growth in height at Port Phillip about 40 feet in twenty years. With *A. Cunninghamii*, amenable to almost any soil, except a saline one, and not subject to any disease. Endures also the vicissitudes of the climate of Lower Egypt, resists sea-breezes to a remarkable degree, ceases to be hardy in the south of New Zealand." Maiden mentions that enormous knots are sometimes produced on it, having most solid timber very suitable for ornamental turning.

6. *Araucaria imbricata*, Pav. The monkey puzzle. This species hails from the mountains of Southern Chili and Patagonia, between 36 degs. and 48 degs., and has for long been a favourite in England, where it stands well and forms a beautiful and striking item in park landscape. It is also being cultivated there now for its timber, which, according to Mueller, is "yellowish white, full of beautiful streaks, capable of being polished and worked with facility. It is admirably adapted for shipbuilding."

Its cultivation in South Africa has, however, been so regularly disappointing that it is well to warn against anything more than trial planting for a time. Perhaps this may be accounted for by its natural habits, which are thus stated in the *Pinetum Danicum*: "A noble tree, growing 150 feet high, and indigenous to Southern Chili, where it is found

on the western acclivities of the Andes, often reaching the snowline, but never more than 2,000 feet below it. The roots are for a long period of the year covered with snow." In England, Scotland, and Denmark, where somewhat similar conditions prevail, it is successful, but here there are no such conditions, except perhaps in the higher kloofs of the Drakensberg, and even there drought is as often experienced as snow during winter. Mueller states that it grows more slowly in Australia than the native species.

7. *Araucaria Rulei*, F.V.M., from New Caledonia, is also included in the list cultivated in the Durban Botanic Garden, but thus far is not so well known as the others.

Cultivation.—Apart from *A. imbricata* and *A. Brasiliensis*, which can hardly be recommended for extensive planting, there are no trees likely to prove of so much economic value on the Natal Coast as these *Araucarias*. They all like open, deep soil, tending to be sandy, but fail upon shallow shale formation and in tidal mud. They also do badly on a cold clay subsoil. They are

safe on most situations up to about 4,000 feet altitude, though, of course, low frosty ground is to be avoided. They show their beauty best when grown as single specimens, but if cultivated for timber planting at, say, 20 feet apart, with a lower-growing undergrowth between, is what can be recommended, pending further trial.

Wood says: "We have a large number of plants of all of these trees except *A. excelsa*, and it is to be regretted that more of them have not been planted, especially in the Coast districts, and it is quite possible that in a soil more humid than that of the Botanic Gardens they might succeed even better than they have done with us."

Mueller says: "*Araucarias* should be planted by the million in fever regions of tropical countries for hygienic purposes, on account of their antiseptic exhalations." *Araucarias* are subject to attack by several insect pests, two of which are described and figured, and treatment advised, in the first Report of the Government Entomologist, 1899-1900, page 106.

Concerning Dipping.

AT a chance meeting with Mr. Joseph Baynes, M.L.A., the Editor mentioned that Mr. P. Otto was of opinion that the sudden drop at the entrance of the tank was unnecessary. Mr. Baynes, on being asked for his opinion, said that he thought the deep plunge was desirable, inasmuch as it ensured a complete submersion of the beast, and that such submersion would not be assured if reliance were to be placed on a Native posted by the tank for depressing the heads. The unreliability of that method would also be increased when animals were following each other with exceptional rapidity. Asked if he thought that the sudden plunge could be so alarming as to be injurious or to cause increased shyness or fear at subsequent dippings, he said he did not hold those views, and that, as a matter of fact, apprehension decreased with every successive dipping. Believing this

matter, although comparatively one of detail, to be of importance, Mr. Baynes was asked if his opinion might be published; he consented. In connection with this subject, it may here be stated that the plans of all dips, old or new, cattle or sheep, of all parts of the world show the sudden drop at the entrance. Another point was touched on, namely, the holding back of animals entering the dip. This hesitation, and frequently, indeed, strenuous opposition of some animals when brought to the brink of the bath, may always be noticed at every cattle dipping. Asked if this troublesome delay could be obviated, Mr. Baynes thought that by doing away with the corners of the entrance footway, that is to say, by curving them, the reluctant animals would find but little, if any, foothold, and that they would be bound to go forward promptly.

Sheep and Arsenical Dip.

MR. VERNEY draws attention in his monthly report for March to the danger of sheep having access to arsenical dips. Rather curiously, the writer was a heavy loser in the eighties from this same cause within a few miles from Mr. Verney's headquarters. Together with the late Mr. Ben Wilkes he had obtained from the Umvoti some 1,700 sheep for dividing. The sheep were badly scabby, and it was arranged to take them to the writer's farm and there dip them and make the division. A primitive apparatus for the dipping was soon constructed. An ox skin stretched on framework for the bath, and a couple of sheets of iron served for a draining board. Happily plenty of labour was available. At mid-day on the day of dipping, after about half the number had been dipped, the kraal was left for lunch. Unfortunately an opened box of

dip was left in one of the corners of the kraal, also two or three hundred sheep. Before lunch was finished word came that sheep were sick and dying. On reaching the kraal the cause was immediately obvious. Scores of sheep had yellow faces; a dozen or more of the packets of dip had been nibbled through. Unfortunately, the attractions of the dip for sheep had not been realised, and even if they had been, it is possible that the thick coatings of paper to each packet might have been considered sufficient security. In a very short time there were over thirty sheep fewer for division. The lesson as to giving sheep access to such dip wants no pointing out. The dipping, apart from this accident, was a perfect success, and some years later, on scab showing in the writer's flock, the same dip was again chosen for use.

Natal Cheese.

AT a store in Maritzburg a consignment of cheese from Mr. James Cole, of Riverside, Polela, weighing some 3,000 lbs., was delivered a few days ago. The cheese was excellent; as good as any of the imported Canadian and American makes, and better than many. It is retailed at 1s. 3d. per lb., a penny cheaper than the imported. The cheeses are made to weigh either 25 or 40 pounds. The cheese is of the Cheddar type, and in the making of which type Mr. E. O. Challis has instructed many Polela farmers. Unfortunately cheese

making in that district, where cheese making has distinct advantages, is not progressing as could be wished. Except on a scale sufficiently large to warrant the employment of a special cheese maker the making of cheese shows no progress. Farmers not so situated find that, in addition to their other work, cheese making does not give them what they consider adequate return for their trouble. They recognise, however, the value of the industry, and are hoping before long to meet their individual requirements by co-operation.

The Cape Regulations for Import of Trees, etc.

THE Import Regulations, published elsewhere in this issue, which have been promulgated by the Cape Government for the purpose of preventing the introduction of insect pests and diseases of plants into the Colony of the Cape of

Good Hope are deserving of attention. The regulations as framed are much more stringent than those in force in Natal, and, if thoroughly carried out, will, no doubt, prove very effective. As they relate to this Colony they will, no

doubt, seriously affect our exports, both with regard to citrus fruits and pine-apples, and nothing in the regulations warrants the hope of any arrangement whereby local fruits might be accepted if fumigated before shipment at Durban. This treatment at the Cape ports has

always handicapped Natal fruit-growers, not necessarily by reason of the fumigation itself, but owing to the marked shortages in consignments which take place as a result of the examination and handling of the fruit.

Potash.

THE article by Mr. L. Ernest Rouillard will be found of general interest. He makes out a strong case for potash, a fertilizer which can hardly be classed as popular in the Colony. On the other hand the splendid results given by phosphatic fertilizers in new land are recognised by all who cultivate. Mr. Rouillard, however, sounds a note of warning; he says that after repeated applications of phosphatic acid the soil becomes deficient in nitrogen and potash. He speaks strongly on what he calls the

"folly" of this system. One gathers from what he writes that phosphatic acid takes the life out of the land, just as a piece of bread used for awakening the vivacity of a glass of champagne leaves the liquid dead. Of course it is in the growing of root crops, rather than in cereals, that potash is the most necessary. Those who may wish to follow up the subject are referred to Chapter VIII. (page 813, Vol. IV.) of the excellent series of articles on Agricultural Chemistry for Beginners, by Mr. Archibald Pearce.

Central Experiment Farm.

MONTHLY REPORT.

DIRECTOR OF AGRICULTURE—

THE most gratifying feature of the month has been the visit of the delegates of the Farmers' Conference to the Farm on the 8th inst. to inspect the results of the first season's operations, and it was very pleasing and encouraging to all concerned to find that their efforts met with so general approval and satisfaction. The very kind remarks expressed by you and the Farm Staff will not readily be forgotten.

The planting season finished in the early part of the month. Since then the Field Experimenter and assistants have been employed classifying and treating seeds, and at various minor work necessarily preparatory to the reaping of the plot crops, which has now commenced.

Hay-cutting and brick-making are still in operation, the weather having been favourable for both.

The laying out of material, erection of fencing and gates have also been in progress, in connection with which I wish to point out that valuable time is being lost in the repairing of the boundary fence on the south end of the farm, which is continually being tampered with and destroyed by Natives passing to and from the Location: they will not avail themselves of the pathway opened on the south-western corner.

A portion of the main crop of mealies which will not ripen now is being cut down, and is to be mixed with other green crops for ensilage.

A commencement has now been made with the permanent buildings: this will occupy all available labour in the transport of building material.

The horses, mules, and oxen are all healthy and in good fair condition. The season still continues dry, little over an

inch of rain having fallen during the month, 85 degs. being the maximum and 43 degs. the minimum temperature. A good many farmers have visited and inspected the farm during the month, and I shall be glad if you will kindly bring to their notice that I shall be pleased to make arrangements to meet anyone at the Riet Spruit Siding.

I have been favoured with the following from Mr. Whelan, Field Experimenter :—

“This month has practically brought planting operations on the experiment plots to a close for the season. Plots of cabbages, kale, kohlrabi, swedes, and turnips for fodder purposes were sown during the early part of the month, as also some small variety plots of prickly comfrey. Ordinary routine work on the plots has been in progress. At date of writing a start has been made at harvesting the first section of potato manure plots, the results of which are rather startling, and clearly show the value of judicious manuring. Tabulated results of these plots should shortly be available. The blight has been general on all the potato plots, and must in a great measure be held responsible for the low aggregate yields, as the blight destroyed all the foliage when the tubers were but half grown.

Somewhat interesting experiments are in hand to test the effect of an application in closed jars of bisulphite of carbon in varying quantities and for various lengths of time for the destruction of weevils in seeds, and its effect on the germination of the seed itself. On the sprayed potato plots operations have been continued during the month with satisfactory results in checking the spread of the blight. On all the late sown root crops the superiority of superphosphates over all the other manures has proved very marked, and has excited the favourable comment of all visitors to the Farm.

In preparation for next season a small section has been sown with leguminous crops to test the effects of green manuring and supplying nitrogen by means of a leguminous crop in comparison with

anolyin : nitrogenous manures direct to the soil.”

ALEXANDER REID,
Farm Manager, Central Experiment
Farm.

Lucerne Seed.

IT may be of interest to some of our readers to learn that lucerne seed from South America can be procured in quantity from Capetown. The following is taken from a letter addressed by the South African and Argentine Live Stock and Produce Co., 1, Rhodes Building, St. George's Street, Capetown. . . . “This seed comes from a district in South America where they do not irrigate, although they have long spells of dry weather, and for this reason we think that it should prove very suitable for this country. It is also taken from land on which it has been customary to graze stock—not merely to keep the land for hay purposes; this, of course, produces stronger growing and healthier plants. We enclose a sample of the seed. . . . In parcels of five to ten tons, £60 per ton.”

Free Entrance for Natal Produce into the Transvaal.

ON the 25th inst., in a *Gazette Extraordinary* of the Transvaal Government, it was notified Natal produce and manufactures will receive the same privileges as regards free admission into the Transvaal as have been granted to the Cape Colony.

At the Cape Colony Farmers' Congress Mr. Goulden moved that in the opinion of Congress the time had arrived when combined action on the part of States and Colonies should be taken for the eradication of ticks and a conference held for that purpose, which was unanimously agreed to.

Perhaps the earliest race for hunters was that at Woodham Moor, in County Durham. In 1613 various knights and gentlemen of the county placed in the hands of two trustees a sum of fifty pounds to provide every year “a piece of gold and silver plate in the form of a bowl or cup of such like form of the value of £7 at least for a hunting prize.” This race was run at Woodham on the Tuesday before Palm Sunday.



ARAUCARIA CUNNINGHAMI,
BOTANIC GARDENS, DURBAN.

(See First Article.)

Veterinary Departmental Report for March, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of March:—

Scab.—Twenty-one fresh outbreaks of this disease have occurred during the month—1 in Dundee, 2 in Umsinga, 1 in Klip River, 2 in Estcourt, 3 in Weenen, 2 in Krantzkop, 1 in Upper Umkomanzi, 3 in Lion's River, 1 in Polela, 3 in Impendhle, and 2 in Zululand.

Lungsickness.—Eighteen outbreaks of this disease have occurred during the month—1 in Dundee, 1 in Umsinga, 1 in Klip River, 1 in Utrecht, 8 in Vryheid, 2 in Paulpietersburg, and 4 in Zululand.

Rinderpest.—No cases of this disease existed in Natal at the end of the month. In Zululand the disease was still as prevalent as before. In my previous reports I have drawn your attention to the prevalence of Rinderpest in Zululand, and the reason why no material improvement has been made. I would especially draw your attention to D.V.S. Tyler's report regarding this disease.

Redwater.—Isolated cases of this disease have occurred during the month, and several imported animals have died. The necessity for dipping cattle is becoming more generally recognised, particularly in such districts as the Ixopo.

Anthrax.—One outbreak of this disease has occurred during the month at the Dargle.

Glanders.—The number of animals destroyed for this disease during the month shows a decrease as compared with the previous month. Eleven clinical cases have been destroyed during the month, and four, which have reacted to Mallein.

Horsesickness.—This disease has accounted for some 215 deaths throughout the Colony during the month. It has been most prevalent in the City, Durban, and the Coast Districts.

I put up herewith the reports of the D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT,
P.V. Surgeon.

18th April, 1903.

MOOI RIVER.—D.V.S. VERNEY.

Sheep Scab.—There are now five flocks under license for this disease.

Lungsickness.—There is now one herd under license.

Redwater.—There has been a considerable amount of this disease during the month both in imported and Colonial stock. When affecting Colonial stock it usually attacks the young animals, animals ranging from 6 months to 3 years. One outbreak that came under my notice occurred amongst animals living on the farm they were bred on. The great thing in treating these cases in Colonial animals is to commence in the early stages of the disease, and when this is done a large percentage yield to treatment. The thermometer is of great use in detecting the initial stages of a case of Redwater, as then the animal's temperature ranges from 105 to 107 degs. Calomel and Epsom salts will be found to be an effectual remedy in treating these cases that are detected in the initial stages of the disease. An English shorthorn bull that had been nearly twelve months in the country succumbed to an acute attack of Redwater. I know of no successful treatment for these acute cases, and when one sees the *post mortem* examination of these cases then it can be easily understood how drugs fail to have the curative effect they are credited with. I trust Professor Koch will be successful in working out a practical prophylactic for this virulent disease.

Four head of cattle were affected with arsenical poisoning, the result of eating Cooper's sheep dip. Two of the animals were found dead, the third died about an hour after I saw him, and the fourth

yielded to treatment of freshly prepared peroxide of iron and purgative. On *post-mortem* examination I found traces of dip in the fourth stomach.

Biliary Fever has been somewhat prevalent. I had a very bad case in an imported stallion. This animal recovered. Other cases have been of an ordinary character.

GREYTOWN.—D.V.S. CORDY.

Scab.—Two fresh outbreaks of a mild nature occurred in the Krantzkop Division.

Lungsickness.—None.

Glanders.—A horse belonging to a Native in the Impanza Location was reported to me as suffering from sores on his legs and presenting generally an unhealthy appearance. On visiting the kraal I found it to be a very bad case of Farcy, showing extensive lesions on both hind limbs and various other parts of the body. As it had not been out of the Location for several months, and no other horses are running in the vicinity, there is little chance of other animals having become infected. This horse was, of course, destroyed. Last month I mentioned that one of the horses tested had given an unsatisfactory reaction and would be tested again. This has now been done, with the result that the animal has had to be destroyed.

Rinderpest.—No cases have occurred during the month, and as the quarantine area was free from disease during the latter part of February I consider this outbreak has now been stamped out. Mr. Martens, who did the inoculation, has now crossed the Tugela to inoculate on the Zululand side of the river, and until the cattle on that side have been done I consider there is a great danger of the disease being re-introduced into this District. Twenty Native guards have now been placed along the banks of the Tugela, with a European in charge, to prevent any animals being crossed.

Horsesickness has not been at all prevalent, only about ten deaths being reported during the month.

Jaagtziekte.—This disease was at one time practically confined to the Noods-

berg District, but now appears occasionally in Umvoti County, Mr. G. H. Van Rooyen, of De Hoek, having during the past two or three months lost nine horses from it. Heaving at the flanks is the first symptom noticed, the animal frequently feeding well and otherwise appearing in good health. The disease frequently takes several weeks to run its course, but it almost invariably terminates fatally. It is undoubtedly a pneumonia due to some specific cause. All kinds of remedies appear to have been tried, but, unfortunately, without the slightest success. Could some light be thrown on the cause of this disease it would be of great benefit to horse-owners in the Noodsberg and other places where it makes its appearance.

Gallsickness was prevalent, probably due to the dry weather.

Redwater.—Mr. Walter Slatter, of Holme Lacy, lost an imported Devon heifer from an acute attack of this disease. There appears to be no degree of certainty as to when an animal can be considered to be safe from this disease, as this heifer had been in the Colony over nine months, and with the exception of the first few days had been running continuously on the veld, and had previously shown no signs of illness.

DURBAN.—D.V.S. AMOS.

The importations have been as follows:—

Oxen..	4,642
Ewes..	2,820
Donkeys..	1,104
Wethers..	1,021
Heifers	258
Horses	210
Rams..	99
Dogs	15
Buffaloes	4
Pigs	2
Bulls	2
Total	10,177

Of the oxen, 4,345 came from Madagascar, 199 from America, and 98 from India. These 98 with the four buffaloes are the first shipment of stock from India, and were sent as a sample. The

oxen were nearly all of a light dun colour, a shade larger than the average Madagascar ox, and with a smaller hump. It will be interesting to see how these oxen will stand the local Red-water. The price asked for these oxen was £12 10s. for the smaller ones, up to £16 for the largest. The four buffaloes were the ordinary water buffalo, and quite broken in; the price asked is £16 per head. The 2,820 ewes came from America, and were sold chiefly for slaughter. The donkeys came from America, and included some very fine specimens. The 1,021 wethers came from Argentina, and were a very good lot of half-bred Lincolns. The heifers, 258, came from Argentina, and were a mixture of Herefords and shorthorns with a few Devon. Of the rams, 50 came from America, and included some beautiful Lincoln and Hampshire Downs. The remaining 49 came from England, and were also pedigree Lincolns and Suffolks. The two pigs and bulls came from England.

Horsesickness during the month has been fairly prevalent and has accounted for 66 deaths in the borough and county of Durban. I am glad to say it now seems on the decrease. The mosquito as the infective agent seems to be more probably proved each year, and those who guard against mosquitoes in the vicinity of their stables have certainly not lost to anything like the extent of others who have taken no precautions at all.

Lungsickness.—Nil.

Glanders, I am glad to say, is not nearly so prevalent. I have destroyed seven clinical cases and one re-acted case. Four stables have been re-tested and horses passed. One stable has been closed as unfit for horses. I am in hopes of seeing a marked decrease in this disease as soon as I have finished re-testing the whole of the stables now under notice for this disease.

Tuberculosis.—300 have been tested but no reaction obtained. I am reporting in a special report on the condition of the Compound, which demands immediate attention.

NEWCASTLE. — D.V.S. HUTCHINSON.

Lungsickness.—In Newcastle Division four quarantines have been removed and three fresh licenses issued. Dundee, one fresh outbreak. Utrecht, one license renewed.

Scab.—With the exception of two outbreaks in Dundee Division, the rest of my District is free from this disease.

Mange in Goats.—Two flocks are still under quarantine in Newcastle Division.

Glanders.—I have had to destroy two clinical cases of this disease during the month, one at Dundee and the other at Newcastle. The Newcastle case occurred among the Public Works Department mules. This case was of a very acute nature. The animal was reported to me "as having a discharge from the nose," and on visiting the case I found the animal with both nostrils badly ulcerated, the submaxillary gland much enlarged and adherent to the jaw. I had the case destroyed, and subjected the rest (thirty-five in all) to a thorough clinical examination, but failed to find any further symptoms of the disease, and on submitting them to the Mallein test all failed to show any reaction. The Public Works Department stables have been thoroughly disinfected three times over, as the stables were open to the paddock in which the mules were confined. And although the animals were never placed in the stables they may have gained access to them accidentally. I can only attribute the infection in this case to the fact that some months ago I took over a large number of mules from the Military Transport Department on behalf of the Repatriation Commission, amongst which a number of cases of Glanders existed. The paddock was used in testing this lot of mules. The outbreak in the present instance may have resulted from the ground having retained some of the previous infective matter, as practically no rain has fallen since that time to cleanse the paddock. The subject at Dundee was an aged race-horse, and he had developed both Glanders and Farcy. The owner informed me that he had noticed a small lump under the animal's jaw for some

time past, but had no suspicion of anything serious being the matter. On the horse developing a discharge from the nostrils he notified the Sanitary Inspector, who immediately reported the case to me. I had the animal destroyed and the stable thoroughly disinfected, and at the same time, advised the owner not to make use of the building as a stable in future. This was the only horse kept on the premises, and so far as I could gather he had not been in contact with any other horses for some considerable time past. A curious feature about the majority of the cases that have occurred in and around Dundee is the fact that nearly all the animals have taken the disease in a very acute form, and have been affected with both Glanders and Farcy. In many instances animals have been covered from head to foot with discharging Farcy buds, and the wonder is how owners and attendants, in some instances, have escaped inoculation from some of these cases, as to all appearances many have been most dangerous subjects to handle. I have several times on my arrival at these cases found persons washing and dressing the sores without their having taken the precaution to use disinfectant, and a warning as to the danger they run should not be out of place here, especially with regard to infective matter being blown into the eyes or gaining access to the system by means of cuts or skin abrasions about the hands.

Natal Redwater. — An outbreak occurred among some cattle belonging to a Native residing on the farm Rooipput, near Newcastle. The owner of the farm reported to me that the Native in question had lost two animals from an unknown cause. On visiting the kraal I found that both carcasses had been eaten, and that two more animals were sick. One of these (a cow) being on the point of death the Native owner consented to have her killed. The animal was suffering from profuse diarrhoea, the mucus membranes pallid, and in a state of general collapse, and as neither of the cases showed diagnostic systems I extracted a small quantity of blood from the jugular vein through an inoculating needle before slaughter. I also took a

small quantity from the other sick animal. On making a *post-mortem* examination I found all the thoracic organs to be perfectly healthy in appearance. Abdominal cavity, liver very slightly congested, scarcely noticeable. Gall bladder normal. Bile normal in colour, but slightly thickened. Spleen, a little congested. Kidneys, dark in colour, congested, structure normal in texture. Stomachs, first, second, and third normal. Fourth, lining membrane pale in colour, but shewing a few congestive patches and full of dirty fluid, about the colour and consistency of strong coffee. The whole of the intestinal tract was also full of this liquid. The small intestines were congested and thickened throughout their entire length. The large intestines were only slightly involved, but were full of the same fluid. The bladder was empty, and the lining membrane and muscular coats normal. The *post-mortem* on the whole was rather puzzling and unsatisfactory, and I quote the case as an instance of the variability of Redwater lesions in general, as it will be seen that in this case they were practically limited to the small intestines. The other sick animal (a yearling) showed a temperature of 105. Mucus membranes pale in colour, dirty mucous hanging about the eyes and nose, *faeces* dark in colour and very hard in consistency, lumpy, and covered with slimy mucous. A peculiar feature in this case was that the animal would continue to turn round in a circle for several minutes together, from right to left, and then remain quiescent for a considerable length of time. The case recovered. This animal had been visibly sick for four days when first seen by me, and the one upon which the *post-mortem* was made had been ill for six days. Both cases had a slight cough, but on questioning the Natives I failed to ascertain whether the animals had passed the characteristic Redwater urine. Being undecided as to the true nature of the disease, on my arrival home I started and made a microscopic examination of the blood and found that the red cells were thoroughly invaded by the Redwater organism, in the case of the cow that had been ill six days fully 75

per cent. of the corpuscles showed the micro organisms. In the case of the yearling a much smaller number of the cells were invaded.

The symptoms and *post mortem* in these cases I consider pointed more to metallic poisoning than Redwater as being the cause of the trouble, and go to show the necessity of making use of the microscope in all doubtful cases of disease where symptoms and lesions are not diagnostic.

In the case of Rhodesian disease by far the most satisfactory method of arriving at a correct diagnosis is by means of the microscope, as the plasmodia of that disease are easily recognised in the blood cells.

I hope the remarks in your early report, re investigation of local diseases, will be the means of each District Veterinary Surgeon being supplied with a good microscope and the small necessary equipment.

The twenty Native guards secured from the Resident Magistrate at Umsinga have been placed along the Transvaal-Utrecht border in positions commanding all the roads and passes leading into the Division.

IXOPO.—D.V.S. POWER.

Scab.—Last month I reported the District free from this disease, but I regret to say that an outbreak has since occurred in the Polela Division.

Glanders.—I examined a horse belonging to Mr. C. Phipson at his farm "Strath Campbell," near Underberg, and found him showing clinical symptoms of this disease. I had him destroyed and then tested five in-contact horses, but none reacted.

Redwater.—There has been a marked falling off in the number of cases of this disease throughout the District during the past month, though isolated cases have cropped up in most parts. Mr. A. H. Walker has just completed the erecting of a dipping tank at his farm at Highflats. He has put his cattle through it, and I hear is well satisfied with the result. From conversations I have had on this subject with stockowners in these parts, I think the majority are in favour of tanks, and I hope to hear of more being erected during the coming winter.

Redwater has been exceptionally severe in this Division during the past summer, as I have more than once reported, and in locally-bred cattle too. I fear that unless tanks are now erected this disease will cause a very high mortality amongst stock next summer.

ESHOWE.—D.V.S. TYLER.

Rinderpest.—In most of the Districts there has been a very satisfactory decrease in the number of outbreaks, Nkandhla and Lower Umfolozi being the only Districts in which the disease now exists to any great extent. In Eshowe District isolated centres of infection still remain, chiefly affecting cattle which have never been inoculated. In the Melmoth District the disease has been stamped out, and both the Ndwan-dwe and Mahlabatini Districts are almost clean. Two of the outbreaks in the Nkandhla District have been suppressed, but the one remaining is a large one, and I am afraid, will spread still further. It is situated on the bank of the Tugela, at and above Middle Drift, in the ward of Chief Ndube. The Natives in this area will have nothing whatever to do with inoculation, and the only means of checking the spread of the disease is by maintaining a strict and thorough quarantine, which is being done. The Lower Umfolozi outbreak is also spreading, and here again the Natives will not inoculate, some objecting to the principle of inoculation, and others to having it done by Natives. Owing to this District being unhealthy I have not been able to get the services of a European. The original outbreak in the Hlabisa District has been suppressed, and only one other exists now and I have no doubt I shall be able to report this District clean very shortly.

Lungsickness.—There have been three outbreaks of Lungsickness in Zululand during March, one in Nqutu District, one in Mahlabatini, and one in Ndwan-dwe.

Scab.—Three outbreaks of Scab occurred in the Nqutu District and one at Melmoth.

Horsesickness.—One death was reported of this disease from Nkandhla and two from Nqutu.

LADYSMITH.—D.V.S. O'NEIL.

Rinderpest has been stamped out of this District, and the quarantine has been raised on the Modder Spruit farm and on the commonage at Umbulwana.

Lungsickness.—One fresh outbreak occurred amongst Native cattle during the month, the sick animal being destroyed to obtain virus to inoculate the remainder of the herd, 23 head, which are going on satisfactorily.

Glanders.—All the Kafir horses and those throughout the District are healthy and looking well.

Horsesickness.—Six cases have been reported throughout the District, but a number of horses have been affected with Biliary Fever.

Redwater.—Eight head of cattle have been reported to succumb to this disease during the month, and several have been cured, amongst them one valuable imported shorthorn cow.

Gallsickness.—Several cases occurred throughout the District, and the majority of them recovered that received purgative medicine in the early stages. Several good recoveries in the Klip River Division are coming under my notice.

Stop-Ziekte.—At the close of the month I visited the Acton Homes District to investigate sickness amongst a troop of cattle, 54 head, one having been destroyed, the owner thinking same to be lungsickness, owing to complication. The five remaining sick cattle, which were developing the same disease, were saved by the prompt attention of Stock Inspector Wales, who recommended dosing with salts.

HOWICK.—D.V.S. WEBB.

Scab.—A few slight outbreaks have been reported during the month.

Lungsickness.—No cattle are under license for this disease in the District.

Rinderpest.—None.

Horsesickness.—I have been called in to attend two cases; both died.

Biliary Fever.—Two cases, both recovered; one case had Laminitis as a sequel.

Anthrax.—This disease made its appearance on a farm in the Dargle, and carried off several head of cattle.

VERULAM.—D.V.S. SHARPE.

Scab.—There is one case in a herd of six Kafir goats near the Umgeni. They are now under license.

Lungsickness.—None.

Glanders.—I shot a horse showing clinical symptoms, belonging to a coolie near here. This was the only horse he had, and I was not surprised to see the inverted "broad arrow" on its quarter.

Rinderpest.—None; a strict guard is kept on the Tugela to prevent its introduction.

Horsesickness.—This month I have heard of 32 deaths from this disease in the District, extending from the Tugela to Port Shepstone. The greater number of cases occurred early in the month.

General.—Stock on the whole are very healthy, and, with the exception of a few cases of "Quarter Evil," two cases of "snake bite," and one of "Bosch-ziekte," there is nothing further to report.

VRYHEID.—D.V.S. CROLE.

Rinderpest has been rather prevalent over the Ngotshi District, but has shown very marked signs of dying out there towards the end of the month. The proclaimed area in the Paulpietersburg District, however, does not as yet promise so well.

Redwater has accounted for a good many deaths, more especially in the Vryheid District, during the month.

Lungsickness is giving great trouble. This part of the Colony has been so long without adequate supervision that matters have got rather out of hand. Since the beginning of the year, however, licensing, etc., has been strictly carried out, so that good effects should be felt in a few months time.

Horsesickness is practically over. The past has been a remarkably healthy season in this respect.

Equine Mange still continues prevalent.

Bots have been causing a great deal of sickness amongst horses here lately.

Cape Regulations for the Import of Trees, etc.

BY Proclamation in the Cape Colony, dated 20th March, 1903, effect was given to the following regulations with reference to the import of trees, etc. The penalty attached for contravention of the regulations is a fine not exceeding £100 :—

1. The introduction into this Colony of trees, plants and portions thereof—such as cuttings, roots, tubers, and bulbs—and of fruit of all kinds, grown elsewhere than in South Africa is prohibited, save and except by sea through the Ports of the Colony or by Post.

2. The importation of the following articles is hereby absolutely prohibited :

- (a) Grape vines or any portion or fruit of any grape vine, with the exception of vines or portions thereof imported by the Government under such precautionary measures as it may deem necessary.
- (b) Coffee plants or any portion thereof, with the exception of seed.
- (c) Eucalypt plants or any portion thereof, with the exception of seed.
- (d) Stone-fruit trees or any portion thereof, including seeds, that were grown or produced in any state, province, or territory of the United States of America or the Dominion of Canada, in which either of the diseases known as Peach Yellows or Peach Rosette exists.
- (e) From and after the 1st day of January, 1904, peach stocks and peach stones from any country whatsoever.

3. From and after the 1st day of January, 1904, the importation of any fruit-tree or portion thereof, with the exception of fruit, seed, seedling stocks for budding or grafting purposes, and blight proof stocks for apples, shall be allowed only by special permission from the Minister for Agriculture. No permit shall be granted for the introduc-

tion of more than ten trees or one hundred cuttings of any one variety, nor shall permits be issued for more than an aggregate of one hundred trees or one thousand cuttings to any party during one year.

4. All trees, plants and portions thereof—such as cuttings, roots, tubers, and bulbs—and fruit of all kinds, and their packages, cases, pots or other coverings, shall, before being delivered to the consignees, undergo an examination by an officer appointed for that purpose to determine, as far as possible, whether or not insects or plant diseases are present; and it shall be the duty of the consignee or his duly appointed agent to open the coverings and to afford every facility to the Examining Officer during the examination.

5. All trees and woody plants, together with their covering and packing material, shall, as a precautionary measure against the introduction of injurious insects, be fumigated at the expense of the consignee in the manner prescribed by and to the satisfaction of the Examining Officer; and if the Examining Officer deems the treatment expedient he may extend it to all other plants and all parts thereof.

6. Should any article, in the examination provided for in Clause 4, be actually found to be infested in whole or in part with any insect or plant disease, the introduction of which would be prejudicial to the interests of the Colony, it shall, together with all other articles in the same receptacle with all covering and packing material, be cleansed or disinfected by the consignee, or at his expense, in the manner prescribed by and to the satisfaction of the Examining Officer; and if not so cleansed or disinfected, or if any treatment at command shall be deemed by the Examining Officer, or found by him, to be inefficient for the absolute eradication of the insect or disease, or if the Examining Officer knows the insect or disease to be of specially dangerous character, the articles shall be destroyed without delay.

7. Ordinarily, the inspection, and other treatment of consignments imposed by these regulations, shall take place on the premises provided for the purpose by the Government at the port of entry; but special arrangements may be made with the Minister for Agriculture for the execution of all the provisions of Clauses 4, 5, and 6 on the premises of the consignee, when approved facilities, inclusive of a proper fumigation chamber, are there provided.

8. On the Examining Officer being satisfied with respect to a consignment that all the regulations and conditions herein set forth have been fully complied with, he shall issue a certificate to that effect to the consignee; and before the issue of such certificate the consignment shall be under his control for the purposes of these regulations.

9. Articles subject to examination under these regulations introduced into

this Colony by post shall be intercepted and examined by an officer appointed for the purpose; and if found infected with any noxious insect or plant disease shall be destroyed or cleansed at the discretion of such Examining Officer, and if requiring fumigation shall be so treated. All expenses of treatment shall be borne by the addressee.

10. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these Regulations, or from any process that may be considered necessary to cleanse or disinfect the articles, or to discover the existence or otherwise of any insect or plant disease.

11. These Regulations shall not apply to any consignment imported *in bond* for places beyond the borders of the Colony; nor to canned, dried or otherwise preserved articles in which there is no longer any plant life.

Potash Manures.

By L. ERNEST ROUILLARD, B.Sc.

[The writer, Mr. Rouillard, while connected with the firm of Messrs. P. Henwood, Son & Soutter, Durban, had occasion to make many analyses of Natal soil, and in consequence what he writes on fertilizers should have special value.—*Ed., Agricultural Journal.*]

THE necessity of potash as an essential ingredient to the healthy development of plants has never been doubted, but its value as a manure had not until recently been so fully admitted as that of other substances, such as nitrogen and phosphoric acid.

From a physiological point of view potash is quite as necessary to plants as any other ingredient, for in its absence the formation of starch and its elaboration from the chlorophyll cells is impossible. Besides, along with nitrogen it is indispensable to the formation of wood, and this has been well observed by Ville, who says: "If potash is excluded from the culture of wheat an ex-

tremely weak plant is the result. The stem is no longer erect, but turns on itself and remains inclined in the manner of creeping plants." It is evident, therefore, that its importance is considerable, and the part it plays in the complex problem of agricultural production is by no means a small one. What are, therefore, the causes which, at least for a time, checked its employment, and what are the reasons which to a certain extent prevented its general use as a manure when compared to the other elements essential to plant life? These are the questions which I intend to investigate. The first bar to the employment of potash was undoubtedly due to its high price, for although the sources of potash are numerous, its extraction from natural products is far from being an easy matter. Potash may be extracted from all kinds of ashes, from sea water, sea weeds, the residues of many industries, especially those of distilleries and sugar manufactures, it is found in

wool and may also be extracted from certain felsphatic rocks, which may be reckoned as the greatest sources of potash, but certainly not the cheapest to work. Formerly the extraction of potash from aquatic plants was raised to a regular industry on the coasts of England, Scotland, Ireland, and France, and up to twelve million tons of sea weeds were annually treated in England alone. The object of these industries was twofold, first for the extraction of iodine, and the residue was treated for potash, but since iodine is extracted from Chili saltpetre, and since the recoveries of the immense deposits of potash salts in Germany, these industries have practically disappeared. From an agricultural point of view, all kinds of ashes should be preciously kept as valuable potash manures, but the question of felling timber for its extraction, which I have heard proposed several times in this country, seems to me "much ado about nothing." According to Warrington, the timber of freely growing trees contains from two to four parts of ash constituents in 1,000 of dry matter. If we estimate that the ash contains an average of 15 per cent. of potash, it would require 10,000 lbs. of wood to supply from 3 to 6 lbs. of potash in supposing that the ashes obtained have not been exposed to rain. In other words, it would require 30,000 lbs. of dry timber to obtain from 9 to 18 lbs. of potash, which can be obtained in 18 to 36 lbs. of sulphate or muriate of potash for a few shillings. The extraction of potash from wool could also be undertaken, for the suint or yolk of raw wool is extremely rich in potash. One hundred pounds of wool can yield half of its weight of potassium salts, especially in the form of potassium carbonate. All these sources of potash are in any case of secondary importance, and I only mention them so that they could be profitable employment in some cases instead of being wasted. Naturally when potash was only obtained from the above sources its price stood at a figure which prevented its general use. This bar to its employment disappeared to a considerable extent

since the important discovery of immense deposits of this salt at Stassfurt, in Germany, which supplies practically all the demand of the world for this substance. Sometime after the discovery of the "Stassfurt" mines a great demand arose for potash salts, it was used without judgment on all classes of soils, and the indifferent results obtained in England in certain cases restricted its general use for a time. Potash was blamed, simply because it was used on soils which already contained an ample supply, and that the law which governs the application of manure on any soil totally ignored, viz.: A matter which is useful to plants and deficient in the soil. The cause of this may be explained on the ground that especially at that time farmers preferred to follow the example of their neighbours rather than to try and obtain fertilizers which would suit their own particular case. The nature and composition of the soils on which potash was used was practically not taken much notice of in the presence of some of the indifferent results obtained and the false conclusion arrived at that potash was not much needed as a manure limited its general application. Such a state of things could not stand before the natural investigations which followed, and the experiments of Voelcker and others proved that although potash did not produce much effect on fertile land its application on sandy soils, old pastures and peaty lands were very valuable. In France the same prejudice against potash followed its first applications for the same reasons, but when it was judiciously used on large tracts of land derived from sandstone, which were naturally poor in potash, it produced wonderful results. In Germany the case has always been different, and potash is rightly considered to be one of the most important fertilizers owing to the fact that a vast extent of land in that country is mainly composed of sand and peat, which answer to potash manures in a marked degree. The general conclusion to be deduced, and which has been deduced from the above remarks, is that potash is a most valuable fertilizer, but

the nature of the soil must be investigated before its application. Speaking generally, many soils derived from primitive rocks contain a good proportion of potash, but all calcareous soil and those derived from sandstone are generally poor in that element. It is also admitted by most writers that many clays are nearly always rich in that element. However true this may be for the Old Country, I cannot say that the analyses I have made of local samples have given me the right to come to some conclusion as regards some of the Natal soils. Although in some cases I have found a fair proportion of potash, soluble in nitric acid, in certain cases I considered that the samples submitted to me contained sufficient potash for the time being, and potash manures could be dispensed with, but none of the soils I have analysed could be considered to hold sufficient available potash for any long period. In certain cases the small proportion of potash in certain clays is probably due to the fact that the clay is made up of a mixture of hydrated silicate of alumina with oxide of iron, while in Europe clays are nearly always composed of an hydrated silicate of alumina and potash.

It follows from this that if potash is deficient even in a certain class of clays its proportion in lighter soils must naturally be low. This is exactly what occurs, and I believe that on a large extent of Natal soils, principally those which are derived from sandstone, the use of potash manures would amply repay a small expenditure on its account. It is naturally difficult to precise the nature of the soil in which potash would have but little effect (without an analysis or a local experiment), but in looking at figures I find that only 17 per cent. of Natal soils I have had occasion to analyse may be reckoned to contain a fair amount of available potash; under these conditions I believe it would be dangerous practice to totally disregard the value of these salts in this country. Another reason which restricted the general use of potash in Europe is the fact that in most cultures which demand a considerable amount of potash farm-

yard manure, *i.e.*, kraal manure, is used to a large extent, and it is well known that this manure is rich in potash. This being the case, its use will certainly diminish the action of potash salts, even in supposing that the soil was not rich in this substance. In Natal the application of kraal manure is the exception rather than the rule, and if we consider that the usual crops, *viz.*, mealies, potatoes, sugar-cane, fruit trees, etc., are greedy potash feeders, more attention should be given to this fertilizer. Unfortunately the farmers here are making the same mistake which has been made all over the world in connection with chemical fertilizers, and especially potash. As a rule, when a farmer begins to manure his ground phosphates in their different forms are generally selected for the first trial. The results obtained are nearly always satisfactory, for it is well known that phosphoric acid has a remarkable effect on most crops, for the reason that it is the substance which is usually deficient in most soils. When Thomas' phosphate, *i.e.*, basic slag, is the form of phosphate used, its effect is often remarkable on soils naturally poor in lime and rich in nitrogen, because it acts not only through the phosphoric acid it contains, but it liberates a certain amount of nitrogen, which is greedily absorbed. The good results naturally encourage a further application of the same substance, and a time comes when the soil becomes deficient in nitrogen and potash, which are extracted from the soil but never replaced. The folly of this system has been fully recognised in Europe and in the United States, and during recent years more attention has been given to the question of complete mixtures instead of special fertilizers, *i.e.*, those substances which only contain one or two essential elements. The most convincing proof of this is the fact that in Germany the amount of potash salts used for agricultural purposes in 1895 was 492,397 tons, against the enormous quantity of 999,431 tons in 1901. Another striking illustration of the value of potash is that in America the quantity used in 1895 was 138,876 tons against 360,253 tons in 1901. I have been into

some details in what may be called a short history of the use of potash manures, simply to show that its value on light soils is considerable, and in any case its importance is such that it cannot be disregarded for any length of time, and unless a soil is abundantly provided with this element it will soon cease to produce remunerative crops without its assistance. In concluding, I must say that it must never be forgotten that there are several factors which govern the important question of economical

production, any one of these factors is naturally called a fertilizer, but the term fertilizer must not be supposed to always mean a complete plant food. Basic slag, nitrate of soda, potash salts, etc., are fertilizers, but each one of them has a special function to perform, and in many cases they must all be used to attain the object which is generally sought for, viz., a maximum amount of production under most economical conditions.

The South African Yoke.

By the DIRECTOR OF AGRICULTURE.

MR. A. L. ALKINS, of Verulam, wrote at the beginning of this month asking that drawings of the improved yoke and bow, mentioned in articles on the 19th December last and the 20th March, should be published, as he would like to make one for trial. Detailed drawings of three of the models sent in are, therefore now published.

Fig. 1 represents the back view of the yoke designed by Mr. T. M. Tanner, of Boston, and made by Messrs. Phipson Bros., of Deepdale. This pattern weighs only 1 lb. heavier than the ordinary South African yoke. Mr. Tanner considers that four oxen with this yoke can do as much as six oxen with the ordinary yoke.

Fig. 2 represents the front and upper view of a yoke which is being made by Messrs. Merryweather & Sons, of Pietermaritzburg. The yoke itself weighs no more than the ordinary yoke, but the hoops, which are made of 1 inch iron piping, weigh a little more than the

skevs. This yoke is easily made, being cut out of a piece of timber 4 inches by $3\frac{1}{2}$ inches in section.

Fig. 3 represents the front and upper view of the American yoke sent by Mr. A. Sinclair, of Dargle. It is really a better model than that shown in Fig. 2, but costs more, as it has to be cut out of a piece of timber 6 inches square. It would also weigh more if made of the thickness shown in the diagram. There is, however, no reason why this form of yoke should be made so much heavier than any other form. The American and Australian yokes are made for heavier beasts than are commonly seen in South Africa, and have to bear the strain of heavier draught.

Several letters have been received making inquiries about the ox harness illustrated in the *Journal* of the 20th March. The Department of Agriculture has ordered samples of all these from Germany, which will be exhibited on arrival.

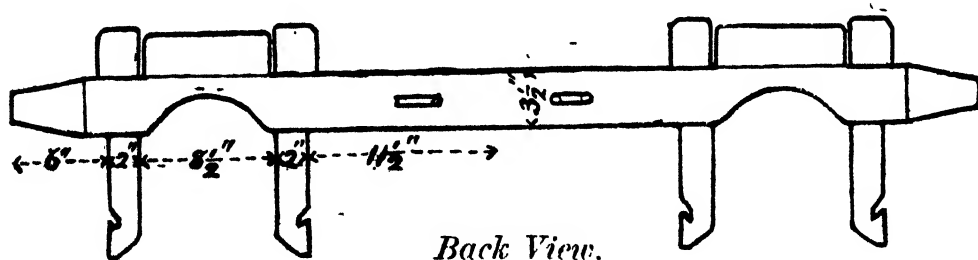


Fig. 1.—MR. TANNER'S YOKE.

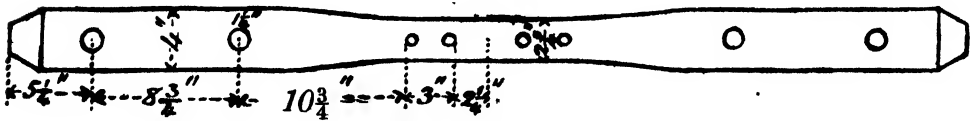
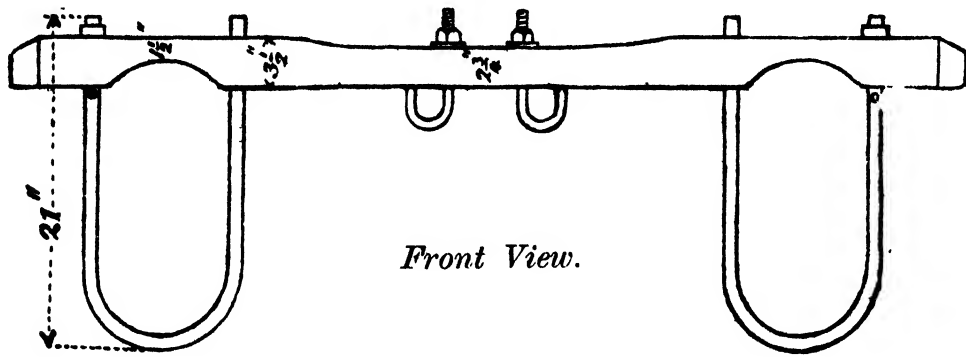


Fig. 2.—MESSRS. MERRYWEATHER & SON'S YOKE.

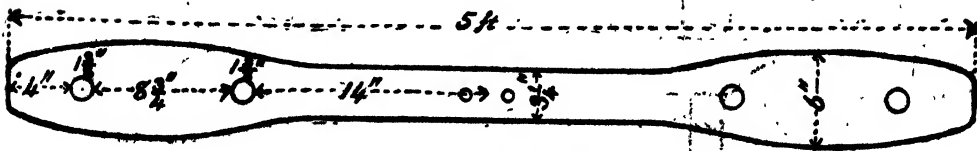
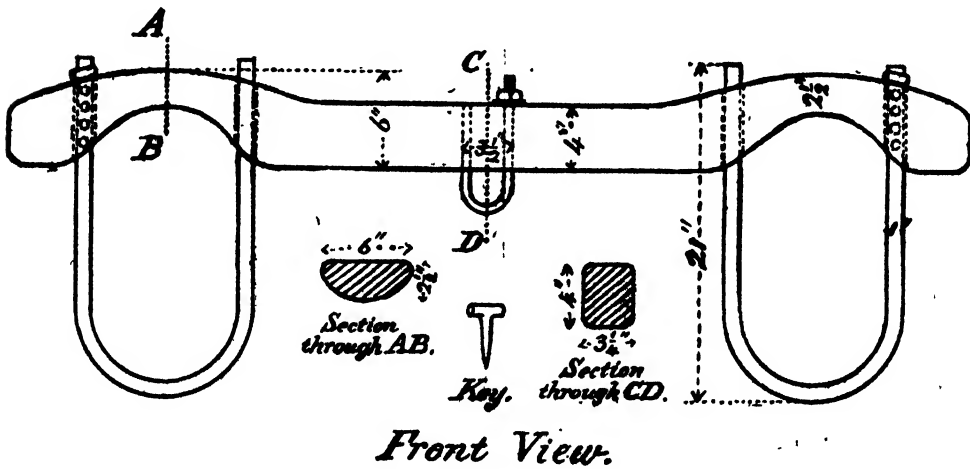


Fig. 3.—MR. SINCLAIR'S AMERICAN YOKE.

Inanda Planters.

ANNUAL MEETING.

FROM the address of the President, Mr. J. A. Polkinghorne, the following is extracted :—

The general outlook is rather gloomy and discouraging. I wish that I could write otherwise, but I must tell the truth. The rainfall is below the average for a goodly number of years past, and with the winter months upon us, we cannot expect to get much more. A short-fall upon the coming sugar campaign will have to be faced, though in the instances of those who have been wise enough to plant Uba canes, the reduction will be lighter than upon all other varieties. With the varying seasons we have experienced during later years, the only canes to be relied upon for producing an almost certain crop is the Uba. Uba, gentlemen, has been, and will be, the salvation of the sugar industry in this county, despite the objections raised against it in certain quarters. The incoming crop is not by any means a bumper one, though in some cases the deficiency will be balanced by the surplus crop of last season still unmanufactured. I regret to say the sugar market has been practically dead. A very great difficulty was experienced in placing sugars at anything like fair prices, or of disposal at all. Stocks increased in Durban to such an alarming extent that the position became critical, and all this owing to the anomaly of a bounty-fed sugar passing through a British Colony over a British railway and into a now British Colony at a less rate than the Colonial-produced article. That restriction is now somewhat removed, and is due entirely to the untiring efforts of the Hon. Mr. Marshall Campbell, who deserves the hearty thanks of the Association and all engaged in the sugar industry, and I trust that this County will see its way to publicly recognise those valuable services. Nor do I forget the fact that His Excellency Viscount Milner has always been willing to afford help in this direction. A resolution was duly

sent, acknowledged by His Excellency the High Commissioner. Although, gentlemen, the outlook, through drought and shortness of labour, is not so bright as one could wish and hope for, we must not forget that other industries have also their times of depression. I ask you not to be disheartened nor discouraged, but, with the exercise of that indomitable courage, and a trust in divine providence, which has been the chief characteristic of agriculturists in all ages, we shall yet reach the haven of prosperity and plenty. The maize crop is painfully and distressingly small. True it is that here and there are exceptions, but, as a whole, the crop is a complete failure, and will press heavily upon the community, especially upon Natives. The amabele crop is totally destroyed by insects, so that in many places of the Colony starvation is already staring the people in the face. It behoves the Government, therefore, to do all it possibly can to grant relief, and to preserve the labour we still have in the county. How that relief is to be afforded is not for me to dictate, but, after careful consideration, I arrive at this conclusion, that the purchase of foodstuffs should be left optional, either by payment in cash or in labour, or part in cash and part in labour. Extreme cases can be dealt with on their own merits. I hold no sympathy with the expression so freely given utterance to, that the drought is a blessing and will force the Natives out to work. No community is benefited, and no country enriched, when the labouring classes have to spend the whole of their earnings in the purchase of foodstuffs, especially when at a high rate, and it must be borne in mind that the greatest burden of want of food falls upon women and children, who are in no way available for the labour market. It is pleasant here to record that the tobacco crop is a fair average one; there is still an abundance of scope in this direction. Natal tobacco, after weary years of ex-

periment, is gaining for itself a ready market, and with care it may be increased to almost any extent. The culture of fruit trees is rapidly gaining favour, and this year a large acreage has been brought under cultivation. Those who have struggled in the past with this class of culture, are to-day reaping the reward by a ready disposal of the fruits produced, and at remunerative prices. Poultry farming is also steadily increasing. This is a profitable undertaking, for there is an almost unlimited demand for both eggs and fowls. The growing of sunflower seed could also safely be ventured upon, the plant growing and yielding well upon the Coast lands, and for which there is a ready sale. I regret to say that there is one serious question before the county, not yet dealt with. I refer to the purchase of properties in the townships along the Coast, and also the acquisition of large tracts of lands, by the Arabian and Indian population. At the present ratio of purchase and possession Victoria County will soon be in the hands of an alien race, and the heritage we shall leave to the rising generation is such as ought to cause

grave anxiety to every Colonist. I trust, therefore, that the sister Colonies, in their desire to procure outside labour to develop their industries, will take warning at Natal's mistake, and insist strongly that, from whatever source they secure their labour, the term of indenture shall terminate in the country from which they come. This is the only safeguard for South Africans, if we are desirous of handing down to future generations the religious, political, and social traditions of the Mother Land. The Native question too is assuming more difficult problems for solution, the experience of all is that the Natives are becoming more insolent, more defiant, and more disrespectful. At present we are slowly but surely drifting into the "unknown," which may, in the near future, bring in its wake trouble, loss, and strife. The only possible remedy that can be effected is to lay down a firm and just policy with united action, which will only take place when once a Federated South Africa under one flag becomes history. May that day soon dawn!

The Suffolk Horse.

THE Suffolks, though perhaps less widely known than the Shires and Clydesdales, may be safely described as the most ancient and the purest breed of our draught horses. While the latter types are the productions of comparatively modern breeding, the pedigree charts of the Suffolks extend as far back as 1768. The purity of the breed is conclusively proved by the uniformity of colour. The breeder of Shires and Clydesdales can never with certainty predict the colour of the offspring, but the Suffolk is always of a chestnut shade, ranging from the mealy to the brown black. His height varies from 15½ to 16½ hands; legs flat, short, and clean; pasterns strong, with bone and compact quality; shoulders long, rather well forward, and peculiarly suited for draught purposes. Hindquarters long,

and well coupled with loin and back; the legs well underneath the body; pirth large; flanks well dropped; strong neck; well-formed head, carried with spirit; the horse in general being long, low, and wide, with a fine amount of quality, and no point jarring against another.

The chief characteristics of the Suffolk are his great drawing power, unusual docility, activity, and longevity. He is more cheaply kept than any other heavy breed, possesses, with an iron constitution, immense power of endurance, and lasts in ordinary work almost as long again as either the Shire or the Clydesdale. Cases have been known where Suffolk mares have gone on breeding when upwards of 30 years old.—*Live Stock Journal.*

Turnip and Cabbage Aphis.

By CLAUDE FULLER, Government Entomologist.

THE common turnip and cabbage aphid is, as a rule, much in evidence at this season of the year, and often occasions considerable damage to the winter crops. In view of the abnormally dry season which has prevailed, the pest will doubtless soon prove mischievous, except in those few localities which had the benefit of the heavy Easter rains.

There is no need in this brief note to recapitulate all that has been written before upon the life history, etc., of this insect, and it itself is sufficiently well known to need no pen picture. In dealing with aphides it is, however, always well to bear in mind their remarkable powers of reproduction and multiplication, as it is the vast number in which the insects occur which determines the extent of the damage.

At this season of the year both winged and wingless insects will be found upon the infested plants, and the former travel and infect other plants. Both forms are equally endowed with the remarkable power of bringing forth young at a very rapid rate without sexual intercourse.

As illustrating the rapidity with which this increase occurs, I may say that from some observations which have been made it has been calculated that in the absence of all checks a single aphid may be the progenitor in sixty days of

3,250,000,000 others, a figure quite beyond comprehension, and including a sufficient number of insects to cover, at the rate of 100 insects to the square inch, an area of ground over 5 acres in extent. Mention is made of this in order to emphasise the importance of any preventive treatment, and also of the results which may accrue from so simple a plan as hand-picking the first infested plants noticed in the crop. It is not a difficult matter to train a Native to go through a field occasionally and collect such into a basket and remove and burn them. There are numerous means of destroying aphides. They readily succumb to various insecticides which kill by contact, and for this purpose paraffin emulsion is extensively recommended, but the effect of such is in proportion to the thoroughness with which the application is made, for, in treating both cabbages and turnips, the difficulty is to apply the preparation used to the undersurfaces of the leaves. Without the aid of a spray pump this is impossible. For small areas no pumps upon the local market can equal the Galloway Knapsack Pump, and good work can be done with this if the delivery pipe which is held in the hand is made about 18 inches in length and slightly bent at the end to which the nozzle is affixed, so that the spray may be conveniently directed upwards.



For larger areas a barrel pump is required which will supply two lines of hose. This is fixed to a 50-gallon barrel

and may be mounted on wheels or carried in a cart. The spray may then be manipulated by one man or two

Natives walking behind the vehicle, as shown in the accompanying rough sketch. Speaking to me of the use of such a pump for the application of a weak solution of nicotine sheep dip for turnip and cabbage aphids, a well-known gentleman in Natal said :—

By this means, and picking the leaves afterwards found with aphids on them, I saved the whole of my crop, quite a third of which was infested with aphids, and I consider that the spraying, which cost but little, has saved me £100 and more.

The use of nicotine sheep dip (free from arsenic) I have often had occasion

to recommend, as it is easily obtained and mixes readily with water, requiring no boiling or other preparation. The addition of a soap solution, say at the rate of 1 oz. of common soap to 1 gallon of diluted solution, which can be used at the rate of one part of sheep dip to 100 of water, cannot help but render the preparation more effective.

Among other treatments, the sprinkling of infested plants with a mixture of soot and fine road dust or airslaked lime and dust, or fine airslaked lime alone, are recognised as good measures, but at the best they can have but a temporary effect.

Mr. P. Otto's Dipping Tank.

ON the opposite page we give an illustration of a cattle dipping tank at Mr. P. Otto's farm, Somerville, Riet Vlei. The tank and its adjuncts, as will be seen, closely resemble the tank and yards at Nel's Rust, of Mr. John Baynes, M.L.A. photographs and a plan of which were published in the last volume.

Mr. Otto's dripping yard and the superstructure of the tank are constructed of 4 by 4 inch Jarrah wood for posts and 3 by 3 inch pitch pine rails. The flooring of the dripping yard is concrete. The tank or bath is built of whinstone laid in cement, and the backing is of well rammed clay. The face is cemented through out. Wattle

wood, charred and tarred, is used for the collecting yard and crush pen. Mr. Otto has already twice dipped all his horses and cattle with perfect success, but if he were building another tank, he says, he has come to the conclusion that he would not have the 5 feet 6 inches drop, but let the animals slide in, and for the immersion of the heads he would have a Native posted about half-way down the tank, whose duty it would be to shove below the surface with his foot the heads of the animals as they swam by. The cost of all complete, with chemicals enough for a couple of tankfuls, came to about £150.

Rapid Fattening.

MR. JOHN KAMMER, of Chicago, is reported to have invented a process likely to revolutionise the practice of fattening live stock, especially cattle. The invention is in the hands of the American Grain Growing Company of Chicago, and consists of a large galvanised iron case covered with a layer of common wood moss, compressed by wire netting, and capable of absorbing a large amount of water. Inside the case are drawers in which corn is placed in layers 3 in. thick, and water is poured into the moss, when the grains begin to sprout,

and in about four days is ready to be fed to stock. Fresh corn is substituted, and the process of sprouting repeated. The cost of the invention is said to be exceedingly low, and cattle eat the grain treated by it with great relish, and fatten very rapidly. The grain, in sprouting, doubles its weight, and becoming soft and nourishing, is entirely assimilated, which is not the case with corn fed in the ordinary way. By this invention the best kind of beef is said to be produced, it being firm, yet tender, and the fat equally distributed throughout the lean.



STOCK DIPPING TANK.

Mr. P. Otto, J.P., Somerville, Reit Vlee.

Garden Notes for May.

By W. J. BELL, Florist and Seedsman, Maritzburg.

KITCHEN GARDEN.—Make succession sowings of Broad Beans, Beet, Brussels Sprouts, Cabbage, Carrot, Endive, Lettuce, Mustard and Cress, Onion, Parsnips, Radish, Sa'safy, Spinach, Savoy, and Turnip.

All kinds of Herbs should be sown at once, such as Parsley, Thyme, Sage, Marjoram, Savoy, Basil, Borage, Lavender, Rosemary, Rue, Wormwood, etc.

Plant out from last month's seed beds Cabbage, Brussels Sprouts, and Savoy. All root crops such as Turnip, Carrot, Radish, Beet, etc., should be thinned out, and sufficient space left for the plants to develop. The thinnings of Lettuce and Beet may be transplanted, and will come on a little later than the plants left undisturbed. It is a great mistake to sow too thickly, as it necessitates heavy thinning, which might have been avoided; besides, the plants which are allowed to remain are not so strong as they would have been if they had had more room in the seed bed. If a good crop is required, the plants must be thinned out in the earlier stages of their growth, and a larger return will result from a given extent of land by so doing.

Stir the soil frequently with the hoe between growing crops; it helps to retain the moisture, besides keeping down the weeds.

Late planted Cauliflowers will be greatly benefited by giving them a heavy mulching of decayed manure, as it prevents the evaporation of any reserved moisture stored in the soil, and which the plants can feed upon during the dry weather.

Flower Garden.—April and May are the two best months in the year for sowing the following Flower Seeds in tins or boxes for transplanting:—

Bellis perennis (English Daisy), *Carnation*, *Cowslip*, *Forget-me-not*, *Hollyhock*, *Pansy*, *Pentstemon*, *Polyanthus*, *Primrose*, *Stocks*, *Verbena*.

The boxes should be well drained by having holes bored in the bottom. Put in a good layer of large cinders or broken

brick and then a layer of rough soil, and finish off to within an inch or so of the top with finely sifted sandy soil; place the boxes on bricks or stones and see that they are perfectly level. Give a good watering with a fine rose, and then sow the seed as evenly as possible on the surface, then sprinkle over with finely sifted soil (just sufficient only to cover the small seeds); and finally place on a layer of grass, straw, or light litter, which should remain until the seedlings show through, and may be removed gradually as the young plants are strong enough to bear the direct sunlight. In the case of very small seeds a water can with a very fine rose only should be used for watering.

While some seeds, such as *Pansy*, *Forget-me-not*, *Stocks*, and *Carnation*, germinate in a week or less according to the weather and time of the year, other seeds, *Primrose*, for instance, germinate very slowly and irregularly and require very great care and patience.

Primrose seeds will commence coming through in about three or four weeks, and it may be several months before all the seeds are through, and this only with the greatest care and attention both in shading and watering.

Polyanthus, although so nearly allied to the *Primrose*, germinates much more readily and double or treble the quantity of seedlings are usually obtained from the same quantity of seed sown at the same time and under the same conditions.

Sow in open beds or borders *Antirrhinum*, *Calendula*, *Candytuft*, *Coreopsis*, *Cornflower*, *Dianthus*, *Eschscholtzia*, *Freesia*, *Gaillardia*, *Larkspur*, *Linum*, *Lupin*, *Malope*, *Mignonette*, *Nicotiana*, *Nigella*, *Petunia*, *Phlox Drummondii*, *Poppy*, *Salpiglossis*, *Scabious*, *Sweet Sultan*, and *Sweet William*.

The Mexican *Poppy* (*Hunnemannia fumariifolia*) should be sown now. This is a new introduction; the flowers are single, somewhat resembling the Iceland *Poppy* in shape, but the colour is of a

rich buttercup yellow, and the foliage is feathery like the *Eschscholtzia*. The flowers keep well when cut, and are most useful for decorative work. It is a perennial and a constant bloomer, thriving anywhere from the Coast upwards.

The *Pentstemon* is a beautiful perennial seldom seen in our gardens. It deserves more cultivation, and can easily be propagated from seed. It is very free flowering, and lends itself admirably for cutflower and decorative work.

This is the best season to sow seed of the perennial *Phlox* (*Phlox decussata*) as the seed is now ripe, and it does not long retain its vitality, and only locally grown seed can be got to germinate. This should be sown in boxes same as recommended for *Pentstemon* and others, and will supply flowering plants for the following summer if the young plants are planted out in spring in rich deep soil.

Correspondence.

To the Editor *Agricultural Journal*.

PASPALUM D. IN MOOI RIVER.

SIR,—Enclosed you will find a photograph (taken by my neighbour, Mr. Thomas Russell, of Farleigh) of a tuft of "*Paspalum dilatatum*" which is growing in my vegetable garden. The inclusion of the tap and hose in the picture is quite accidental. It must not be thought, however, that the thriving appearance of the grass is due to its having been watered. At the time the photo was taken—January last—the drought had not made itself felt here. I have *Paspalum* growing in my fields, where there are no taps, and it is almost as well grown as the plant in the picture, although we have had severe drought, and the soil in which it is growing has not been so well treated as that in my garden. The grass in the photo is over 3 feet high, and it is about 9 feet across. It consists of one plant only, which was about twelve months old when the photo was taken. Last winter it stood the frost splendidly, but it was much troubled by hares. Finally these pests ate the grass down to the roots, all except a bit on one side which was not easily reached. This remained green all through the winter. My *Paspalum* in the fields, which are in a frostier locality than the garden, kept green until about the end of July, when the continual severe frosts dried it up a great deal. I am about 5,000 feet above the sea, and frosts with me are almost as severe as at Mooi River Station, which is accounted the coldest place in the Colony.

I have a great opinion of the value of "*Paspalum dilatatum*" for Natal, and I am making haste to plant all I can. I have met with very bad luck this year, however, on account of the drought. I gathered and planted ten acres of seed this season, but owing to the drought very little has germinated, so that I am very little further advanced than I was this time last year. I hope for better luck next season.—I am, etc.,

WM. CARTER.

Highthorn, Estcourt,
28th April, 1903.

[This testimony with regard to the growth of *Paspalum dilatatum* in the Upper Mooi River District is valuable. The photograph depicts exactly what Mr. Carter describes, and will be shown with pleasure at the Editor's Office to anyone who wishes to see it. Unfortunately the picture does not lend itself to the reproduction process.—Ed., *Agricultural Journal*.]

In Ceylon, and in the Straits Settlements large plantations of Para rubber (*Hevea brasiliensis*) have been made by private enterprise. The Government of India now propose to plant 10,000 acres in Burmah with the same tree, a proceeding viewed with dismay by the private growers in the colonies aforesaid. The Secretary for the Colonies has been memorialized on the subject, but the demand for the rubber is so great that it is hardly likely that steps will be taken to limit the output in any way.

A Corrupt Show Judge.

RARELY, if ever, are cases heard of judges at agricultural shows abusing their trust. Incompetence, especially by those whose exhibits are passed over, is not infrequently alleged against them, but their *bona fides* is only most exceptionally questioned. In Queensland recently a case of the worst kind came before the law courts of the colony, and the punishment was suitable. A farmer, William M'Nab, was charged with "wickedly devising and intending to cheat and defraud" certain agricultural associations. The case for the Crown showed that M'Nab was a large sheep farmer. He was a well-known and wealthy man, and acted as judge at the various shows. The Numurkah Agricultural Society held a show at which M'Nab was appointed to judge the sheep. He then arranged that a

number of his sheep should be exhibited as the sheep of Rash Brothers. M'Nab adjudged the sheep the best in the pens, and they were taken on to Bacchus Marsh and entered there in his own name, where some of the sheep were awarded prizes. After the hearing of the case had been advanced to this stage, M'Nab proposed to plead guilty. The Judge said that a man who was ready to sacrifice all decency and self-respect to gain a few pounds would feel the loss of money to be an affliction, and therefore he was a man who, although imprisonment might not be proper in his case, would feel the punishment of a fine. "I therefore direct he pay a fine of £500, and that he be imprisoned until the fine be paid." M'Nab wrote out a cheque for the amount of the fine, and shortly afterwards was released.

Butter from Copra Oil.

THE fact that a new and thriving industry is carried on at Marseilles for the manufacture of the "best butter" from copra oil will be received by English people with mixed feelings (says the *Pall Mall Gazette*), for it is undeniable that there exist old-fashioned consumers who actually prefer ordinary home-made butter to the best margarine!

We learn from a Consular report just received that over 600 tons of butter manufactured from copra oil are turned out monthly by one Marseilles firm alone. The trade designation of this butter—or, as the fastidious might term it, "edible grease"—is *vegetaline*. The best export markets at present seem to be Holland, England, and Germany. It is offered for sale in tins, and is almost tasteless.

The actual process of the manufacture of this imitation butter is a matter of excited curiosity in Marseilles, where the

story runs that £12,000 has been offered for the secret. The oil having by nature in a large degree the consistency of a genuine butter, the main problem has been to bleach it, to remove the rancidity, and to increase the point of fusion. The bleaching operation is probably accomplished by the free use of fuller's earth, which, being beaten into the oil, absorbs the colouring matter, and is then precipitated and removed. The next step in the process is difficult to determine, but obviously some chemical process is employed. English manufacturers have lately learned something of the bleaching methods adopted, and are beginning to employ them. The present price of *vegetaline* (f.o.b. Marseilles) per 100 kilograms (220 lbs.) is 89 francs, say 4d. per lb. We hope the Inspectors under the Adulteration of Foods Act will keep a sharp eye on this unwelcome intruder.

The Cure for Mosquitoes.

THERE is a widely spread belief, both amongst natives and amongst the white sojourners in Western Africa, that the presence of a certain species of plant in a room drives away mosquitoes, and, in fact, a single plant is said to be sufficient to clear a room. On his recent return from Northern Nigeria, Major J. A. Burdon, of the Cameron Highlanders, brought with him and gave to me a few leaves of this plant. These, through the kindness of Mr. H. H. W. Pearson, have been identified by the experts at Kew as belonging to *Ocimum viride*, Willd., a member of the order Labiatae, which occurs from Senegambia southwards to Angola.

Major Burdon, who is resident of the Nupe Province, Northern Nigeria, and Hausa Scholar of Christ's College, Cambridge, has given me the following account of the plant :—

A fragment of what turns out to be *Ocimum viride* was given me in August last at Lokoja, Northern Nigeria, by Captain H. D. Larymore, C.M.G., R.A., Resident of the Kabba Province. Capt.

Larymore's notice had been drawn to the plant by a native living in a low-lying part of the native town at Lokoja, who had told him that the natives suffered very little from the swarms of mosquitoes which existed in that part, as they protected themselves from them by the use of this plant.

"Capt. Larymore made enquiries and obtained a few specimens of the plant, which grows wild, though not very abundantly, in the neighbourhood of Lokoja. These specimens he planted in pots and boxes and kept in and about his house. The specimens I saw were about the size of a geranium.

"He informed me that the presence of one of these plants in a room undoubtedly drove the mosquitoes out, and that by placing three or four of the plants round his bed at night he was able to sleep unmolested without using a mosquito net. This is very strong testimony to the efficacy of the plant, for the house in which Capt. Larymore was living is, as I have cause to know well in former years, infested with mosquitoes."
—*Tropical Agriculturist*.

Rice Meal for Dairy Cattle.

RICE meal (according to the *Scientific American*) is a material which dairy farmers have recently been using in increased quantities as a food for dairy cattle. The advantages of rice meal, it is stated, are its high percentage of oil, which averages about 12 per cent., some containing as much as 15 per cent. The oil is one that becomes solid at ordinary temperature, possesses a sweet odour and agreeable taste, and is in every way a satisfactory food constituent. The mild and pleasant flavour of the meal is also an important factor, for obviously it is thus rendered free from any objectionable properties in this respect to dairy produce, while the richness of the ash in phosphoric acids assists in making it well adapted to the preparation of young animals' natural food. Rice meal contains a compara-

tively low percentage of nitrogen, which is equal to about 12 per cent. of albuminous substances, but, nevertheless, with the exception of only a small proportion, these consist of albuminoids, and they as nutrients, are by far the most valuable constituents containing this element. However, an increase in the quantity present may be made with advantage, and as the percentage of oil is so considerable, it is possible to mix with materials poor in that ingredient, and yet obtain a food supplying a satisfactory amount. For example, by adding beans and peas to rice meal, in the proportion of two-thirds of the latter to one-third of the former, a valuable and digestible feeding stuff may be prepared, for these leguminous seeds, although poor in oil, are very rich in nitrogen.

Weekly Rinderpest Report.

UP TO 28TH APRIL, 1903.

Krantzkop Division.

Amobonvu Location.—1 dead ; 6 sick.

Estcourt Division.

Rossendale.—No deaths ; no fresh cases.

Sans Souci.—Fresh outbreak ; 3 sick.

Bursea.—Fresh outbreak ; 3 sick.

Zululand.

Eshowe District.—33 dead ; 45 sick.

Mahlabatini District.—2 dead ; 3 sick.

Umlalazi District.—4 dead ; 9 sick.

Lower Umfolozi District.—3 dead ; 17 sick.

Nkandhla District.—No report received.

Nongoma District.—2 dead ; 6 sick.

Entonjaneni District.—No report received.

Paulpietersburg District.

6 dead ; 10 sick.

Vryheid District.

8 dead ; 13 sick.

S. B. WOOLLATT.

P.V. Surgeon.

28th April, 1903.

District Reports.

UMZINTO, 22nd April.—During the last fortnight some nice rains have fallen and the mealie crop looks well, and it is reckoned that over 50,000 muids will be sent away from the local railway station. The local troop of the B.M.R. have returned from the encampment, where they appear to have had a very good time. The first Circuit Court ever held here was opened on 15th inst. by Mr. Justice Beaumont, and was concluded on 21st inst., and the jury, who were gentlemen of standing and mostly conversant with the Native language, brought in a verdict of guilty of murder against eight of the accused, which sentence was considered to be a correct one by the Natives, who listened attentively to the case.

F. E. FOXON, Magistrate.

WEENEN, 21st April.—Good rains have fallen here during last week, and the country, which was getting very dry, has now assumed a

spring-like appearance. Unfortunately the rain has come too late to save the greater part of the Native mealie and mabele crops. The tillers of the soil have resumed their calling with renewed vigour ; in fact, the new block-holders on the Weenen Settlement appear to have infused new life and energy into the local farming community, who are losing no time in putting in winter crops. It is to be hoped the frost will keep off for a few weeks yet. Scarcity of grain and the approaching hut tax collection have somewhat improved the local labour supply. The presence of aphids in the mabele crops is reported by Natives from different parts of the Division. This latest scourge, they say, is quite unknown to them, and even to their ancestors. Stock of all kinds is doing well. No fresh outbreaks of glanders have come to my notice, and the disease appears to have been completely stamped out. Only a few cases of horse-sickness have occurred this season.

H. K. ROSSLER, Acting Magistrate.

Pound Notices.

THE following stock, unless previously released, will be sold on the 3rd June next :
Isipingo.—Hammel, notched ears, brand indistinct ; Madagascar ox, black, brand ML near off rump, H shoulder.

Moss Dale.—Running on the farm "Low-vale" :—Angora ewe, one horn broken off two inches from the head, one ear cut square off, also slit, other ears swallow tail ; merino ewe lamb, about 5 months old, poor condition, long tail, no marks or brands.

Ladysmith.—Dark bay or brown mare, near hind foot white, otherwise dark points, white spot on forehead, branded HW on off hind-quarter, long tail and mane, about 15 hands high, aged ; chestnut filly, star on forehead, no brands visible, about two years old ; dark brown gelding, no brands visible, rising two years old.

Greytown.—Running on the farm Paade-

fontein, Fawn Leas :—Black mare, branded H3 right hindquarter, small white star on forehead, two hind fetlocks white, long tail, age about seven years.

Candella.—A small black she donkey, with a little white under belly.

Vryheid.—Chestnut mare, white star on forehead, near fore foot white, long mane and tail ; black mare, long mane and tail, branded M on off hind hip, both hind fetlocks white, cut in left ear.

Weenen.—Running on J. H. Stadler's farm, Schottapoort :—Black cow, white on belly, about 4 years old, no brand or ear marks, with black bull calf, white belly, about 6 months old, no brand or ear marks.

Bulwer.—Grey billy-goat. The above animal will be sold at the expiry of one month from this date, 23rd April, if not previously released.

Agricultural Shows.

Greytown, Thursday, 14th May. Entries close 25th April. President, A. Kohrs. W. H. Gibbs, Hon. Secretary.

Ixopo, Thursday, May 21st, 1903. Entries close with Hon. Secretary on Saturday, May 9th. Fred. Thompson, Hon. Secretary.

Bulwer, Thursday, 28th May. Entries close 9th May. President, J. F. Alexander. Hon. Secretary, A. Brown.

Estcourt, 3rd and 4th June, 1903. President, H. Blaker, J.P. E. Cauterley, Hon. Secretary.

Umzinto, Thursday, 18th June. Entries close 13th June. Hon. Acting Secretary, R. G. Archibald.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries (to be made to Messrs. Duff & Eadie, Assistant Secretaries, 19, Timber Street) close 4th June; late entries 11th June. President, Sir T. K. Murray, K.C.M.G. A. Whittle Herbert Hon. Secretary.

Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President A. W. Cooper, J.P. Hon. Secretary, John Marwick.

New Hanover, Friday, 24th July. Entries close 11th July. T. B. Train, Secretary.

Mid-Illovo, Thursday, 5th August. Entries close 15th July; late entries 20th July. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Frits Reiche, Hon. Secretary.

OTHER SHOWS.

Natal Poultry Club, Monday, 1st June. Entries close on 11th May. Fred. Chapman, Hon. Secretary.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 24th June. Secretary, W. E. Allsopp.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 27a.—Is 26 years of age, and has had considerable experience in New South Wales, where he was at one time an overseer of the Cowl Cowl Station; has also had experience in breeding horses for the Indian trade. Applicant has a knowledge of poultry farming and market gardening.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

No. 40a.—Aged 25, studied for veterinary profession, but did not qualify. Has had four years' agricultural experience in Cape Colony, and two years' in Barterton District of Transvaal. Is anxious to get work, irrespective of nature of employment.

No. 42a.—Englishman, 24 years of age. Has had life experience of agricultural, stock, and dairy farming in Cheshire, where he had the management of a farm, and gained several prizes for cheese-making. Is anxious to get on to a dairy farm, if possible.

No. 43a.—Is at present a student at the School of Agriculture, Kullt, near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.

No. 44.—Young lady of English parentage, who has had two years' training in poultry farming at Lady Warwick's Hostel, and who has also been at Reading College Poultry Farm, is open to accept an appointment for a year or two, where she will be able to acquire local experience of poultry farming.

No. 45.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.

No. 46.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of meat, fruit, and market gardening. Salary not so much an object as a situation.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ... M. Hattingh ... W. de Ba'the ...	Snelster. Nokopela. Otterbush.
J. Button ...	Estcourt, South of Bushman's River	Lungsickness	D. W. Mackay ... R. Wright ...	Dalton. The Alps.
J. J. Hodson ...	Lion's River ...	Scab	J. King ... C. Strapp ... J. & E. Parker ... E. Parkinson ... H. W. Wardale ... G. & B. Hutchinson ... P. D. Kimber ... W. Wilson ...	Lynedoch. Oatlands. Tetworth. Klipfontein Beverley. Boschfontein. Maritzdaal. Thornton House.
K. Soutar ...	Portion of Lion's River	"	F. Stanley ...	Nonpariel.
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe.
W. Wilson ...	Polela ...	"	J. Isbister ...	Buckquoy.
L. Trenor ...	Alfred ...	"	Mongola, Guveel, Qupass, and Ntokolo	Location.
A. H. Ball ...	Weenen ...	"	J. P. Lotter ... T. Hair ... H. J. Vandermerwe	Berg Vleit. Gretna Green. Exchange.
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	J. Vandermerwe	Nood Hulp.
C. J. Van Rooyen	Krantsakop ...	"	Mrs. Nel ... J. P. Nel ...	Ungegunt. Sweet Home.
R. J. Raw ...	Impendhle ...	"	J. B. Griffin ... C. P. Speirs ... W. M. Fisher ...	Kimberley. Mount Park. Myrtle Grove.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 44 herds of cattle under license for Lungsickness, and 14 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	2 for Lungsickness,	— for Scab
Klip River	"	...	...	6	4 "
Dundee	"	...	...	2	4 "
Umsinga	"	...	...	2	2 "
Upper Tugela (North of Tugela River) Division	...	...	...	—	2 "
Utrecht District	...	...	...	—	— "
Vryheid	...	...	...	8	2 "
Paulpietersburg	...	...	...	2	— "

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	2	for Lung sickness	1 for Scab.
" Nkandhla and Nqutu Districts...	...	8	"	3 "
" North of White Umfolosi and Umfolosi Rivers	...	8	"	— "
Total	...	40		18

The following farms are in quarantine for rinderpest :—

Krantzkop Division.—Amobonvu Location.

Estcourt Division.—Rossendale and Bursaa.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 29th April, 1903.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write :—

Trade in many lines is almost at a standstill, and what was predicted some months back regarding the crops is now confronting us as an accomplished fact. Many districts in Natal will have absolutely nothing to bring to market. There is, however, a certain amount of satisfaction in knowing that some farmers are talking about reaping 500, others 1,000, while one informs us that he will reap 1,500 bags of mealies, and these live in localities where it was freely stated at one time that no mealies would be gathered. Nevertheless, there is now no denying the fact that the yield will be the lowest known for a very great number of years.

Mealies.—A few new mealies are now coming forward, but the bulk now consumed consists of either North or South American grain. Unfortunately, many of the former are far below par, but large shipments are now ordered. Natal mealies have been selling at 28s 6d per muid, and imported grain from 22s to 26s.

Forage.—Very little offering; 16s per 100lbs being about the average.

Hay.—From 1s 3d to 4s 8d per 100lbs; bedding, from 14s to 32s per load.

Potatoes.—From 5s 9d to 15s per 100lbs.

Sweet Potatoes 5s 9d to 7s 6d per bag.

Onions.—From 12s 3d to 29s per 100lbs.

Pumpkins.—From 2s to 19s per dozen.

Beans.—From 17s 6d to 20s 3d per 100lbs.

Lucerne.—About 7s 6d per 100lb.

Poultry.—Common fowls, from 1s 2d to 7s 6d each; geese, 7s each; turkeys (cocks), 8s 3d to 11s each (hens), 7s each; ducks, from 3s to 10s per pair.

Butter.—From 1s 5d to 3s per lb; salt butter, 1s 6d per lb.

Eggs.—From 2s 1d to 4s 3d per dozen.

Sundries.—Mutton, from 7d to 9d per lb; pork, from 3d to 7d per lb; beef, 3d to 6d per lb; rabbits, 1s 6d to 3s each; pigeons, 1s 11d to 3s 1d per pair; sucking pigs, 2s 6d to 3s 6d each, and 4s 6d to 6s each; walnuts, 2d to 6d per lb; monkey nuts, 10s 6d to 10s 9d per bag.

Vegetables.—Beans, beetroot, brongalls, cabbage, carrots, cauliflowers, celery, eschalots, lettuce, parsley, potatoes (new), radishes, tomatoes, turnips, and rhubarb.

Fruit.—Apples, bananas, grenadillas, guavas, guavas (China), lemons, pears, pears (Avocada), pineapples, and a quantity of Cape grapes and other imported fruit.

Firewood.—From 7d to 1s per 100lb.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes :—

General.—Things are dull and quiet in all departments. No doubt prospective alteration of Customs tariff is having something to do with this.

Mealies.—Supplies are still much below requirements. Quotations are extremely variable, but 23s. 6d. per muid for reliable imported qualities about represents the market price. All North American shipments are arriving in heated and bad condition, and when competition ceases heavy loss will probably ensue.

Potatoes.—21s is being paid on morning market for best samples. Farmers having crops would be well advised to off-load every bag as soon as possible, as importation is sure to set in ere long.

Forage.—11s. to 12s. is paid for first quality only, but demand is limited.

Hay.—Th's article is still in small supply at about 5s. per 100 lbs.

Mabele is largely enquired for, but no one appears to have any for sale.

The Natal Creamery average test for April 21st was 4.8, which is equal to 18.46 lbs. of milk to 1 lb. of butter.

In view of the shortness of the English hop crop, prices will be higher than has been the case for some time. For the best hops it is contended by English growers that as much as £10 per cwt. ought to be paid.

The Agricultural Journal

AND MINING RECORD.

VOL. VI.

FRIDAY, JUNE 12, 1903.

No. 10.

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NOTICE.

The printers' strike having ended, the publication of the "Journal" is resumed. It was hoped that by supplemental pages more special, and other matter particularly pertaining to the present issue, could be published, but this course proving impracticable the forbearance of contributors and readers is asked.

Rhodesian Fever.

ELSEWHERE, in this issue, will be found in full the First Report on the Rhodesian Cattle Disease by Professor R. Koch, the eminent bacteriologist.

Professor Koch confirms the views already given by earlier investigators as to the similarity of the Rhodesian Fever to Texas Fever, or what in Natal is known as Redwater, but he points out clearly that in several important respects

it is wholly different. In Rhodesian Fever the blood parasites are not the same in shape, and are smaller than those found in cases of Redwater. Again, in Redwater there is great blood impoverishment (anaemia) owing to the destruction of the blood corpuscles by the parasites, but this feature is not a chief characteristic of Rhodesian Fever. Although the blood corpuscles are more abundantly inhabited in Rhodesian

Fever, yet they are not so extensively destroyed, and consequently the anaemia of Redwater is absent. The Rhodesian Fever, though allied to Redwater, is different, just as the various types of human malaria differ, types which were formerly classed as one. Were the two diseases of exactly the same character, a complete or at least a certain degree of immunity should have been manifested by stock from redwater districts; but this is not so, says Professor Koch, therefore they cannot be considered identical, nor is the view that Rhodesian Fever is merely more than an unusually virulent form of Texas Fever a tenable one. "The problem," says Professor Koch, "would be well nigh insoluble if there was not one piece of evidence in our possession which I became cognisant of some years back, namely, that the same disease exists on the East African coast as has now broken out in Rhodesia, and that in German East Africa the disease was carried inland in a similar manner to that in which it may have been brought from Beira to Umtali.

"The stock on the coast of German East Africa are apparently quite healthy and in the best condition, but as soon as other cattle are brought there from clean districts, for instance from the inner

parts of the country, and graze on veld on which the cattle from the coast have been grazing, these imported animals will get sick and almost all die.

"The indications of this disease are the same as those of Rhodesian Fever, and in the blood of these infected animals, which I have many times examined, I have always found the same small blood parasites which I have again seen at Umtali, Salisbury, and Bulawayo."

Professor Koch believes the explanation of the outbreak will be found in the importation of 1,000 head of cattle in 1900 from New South Wales. They were landed at Beira, where the East African cattle fever exists, and the beasts being highly susceptible, he argues, contracted the disease and carried it with them to Rhodesia.

Owing to the extreme virulence of the disease, Professor Koch foresees no little difficulty in finding a suitable virus for inoculating purposes, but he has no doubt that one for producing immunity will be discovered sooner or later, and to that end he is now concentrating all his attention.

In this summary we have only touched on the more salient features of the Report—one of great interest, and which will well repay perusal.

Dunsickness.

THIS disease, which seems to be, as so many of our stock diseases are, confined to South Africa, is responsible for a considerable annual loss. In fact in some districts of the Midlands horse-breeding has been greatly interfered with from this cause. The disease would seem to be one of the larger class of disorders which are connected, though in this case perhaps indirectly, with digestive derangement, over-stocking, and mal-nutrition.

As far as can be seen, the disease is closely connected with intestinal parasitism, and it may be that further observations will be able to point to a specific

cause in some one definite parasite (to which the horse is a host), which can only gain a firm footing when depletion of the animal's system from lactation or other cause is brought about.

Mr. Watkins-Pitchford (the Government Bacteriologist and Director, Veterinary Department) will be glad if horse-breeders who are interested in this disease will be so good as to communicate with him in order that enquiries may be instituted, and the valuable opinions of men of experience made use of, in the hope of devising some definite measures of cure or protection from the disease.

Passing Notes.

CENTRAL EXPERIMENT FARM.—The Minister of Agriculture wishes it made known that anyone desiring to visit the Central Experiment Farm at Riet Spruit may at any time do so. Whenever possible, visitors should write to the Farm Manager at least forty-eight hours beforehand, in order that arrangements may be made for meeting them at the Riet Spruit stopping place. Passengers by the 8.40 a.m. train from Maritzburg must notify the guard at Hilton Road, and passengers by the 5.10 a.m. train from Mooi River or the 7.35 a.m. train from Estcourt must notify the guard at Howick that they wish to be set down at Riet Spruit. Communications should be addressed to "Mr. Alex. Reid, Farm Manager, Central Experiment Farm, Riet Spruit, Hilton Road Post Office."

STEAM PLOUGHING.—A steam traction engine for ploughing and other work has been ordered by the Department. The order, sent to Messrs. Marshall, Sons & Co., Gainsborough, England, specifies 8 nominal horse power, of the compound type, with compensating gear, arranged for two speeds, winding forward drum, and extra wide tyres on both back and front wheels. The engine will be used for traction, ploughing and forwarding agricultural machinery.

THE FORESTRY BILL.—The regulations for the conservation and exploitation of Crown Forests, published recently as Proclamation No. 58, 1903, bring the protection and the working of the Crown Forests into a condition as similar to that of the Cape Forests as can be done without further legislation. They differ considerably from what were formerly in force in this Colony. Among other changes the regulations and tariff for licenses for Zululand are assimilated with those for the rest of Natal. The forests are separated into "demarcated forests" and "undemarcated forests," the former being intended eventually to include all the better high-timber forests, and the latter the thorn-scrubs and other poor forests; while

the restrictions with reference to the "demarcated" are more numerous and severe than with reference to the "undemarcated" forest. The timbers are classified into "reserved" and "unreserved" kinds, a list of "reserved" kinds being given, which kinds are not to be felled or removed from any Crown Forest until each tree has been numbered and measured by a forest officer, and a license obtained on that measurement by the purchaser. The old method of measuring the sawn timber and taking no account of the unutilised balance of the tree has been abolished. The felling, removal, or destruction of forest produce of any kind is prohibited in all Crown Forests except on license or permit, granted by a forest officer, and the squatting on and clearing of forest land, which has done much damage to Crown Forests in the past, is put under control. Provision is made for the domestic requirements of Natives in Zululand as formerly, free of charge, from unreserved kinds, from certain forest areas. The control and working of the forests is placed in the charge of the Conservator of Forests, and a fixed tariff for the sale of timber, fuel, etc., is given, subject to certain modifications in exceptional cases. Contravention of any regulation incurs liability to a penalty not exceeding £20, or an alternative of three months' hard labour.

SORGHUM FOR FODDER.—A short time ago Mr. William Teasdale, Lidgetton, kindly invited me to see some sorghum which he had planted experimentally for fodder. The kinds were *Sorghum vulgare* and *Sorghum saccharatum*, or, as Mr. Teasdale in conversation described them, the red or broom kind and the black. The seed was purchased from Messrs. Pechey Bros., Maritzburg. About an acre was devoted to each kind. The soil was rich with kraal manure, and a slight dressing of Thomas' phosphate had been drilled in at the planting. The crop of the red kind was poor both as regards stalks and grain. The heads or tassels of this variety presented

a very graceful appearance, and close inspection showed these heads are what are used in the making of the cheap American house brooms, so popular in this Colony. For brushes and brooms these heads are worth from £15 to £30 per ton in Europe. The pith of the stalks on being tasted was found to be extremely tough, and to the palate it was quite devoid of sugar. The black cane (*saccharatum*) carried a much heavier crop of grain, and indeed in general abundance bore a close resemblance to the common mabele of Natal. It is, of course, almost needless to state in this publication that mabele is of the sorghum family. The grain crop was good, and the pith was tender and sweet; it was similar in these respects to the pith of a mealie stalk at the same stage of growth. As a result of the experiment, Mr. Teasdale has come to the conclusion that sorghum of these two classes will in no way compare favourably for fodder, either for chaffing, shredding, or silage, with the mealie.—Ergates. [We have in hand an interesting article on broom-making, which we shall publish in an early issue. Broom-making would, in all probability, prove a profitable industry for Indian cultivators on the Coast, providing handles could be cheaply obtained.]

WATTLE PLANTING.—The article by Messrs. Holley Brothers raises a point of great interest, that of the proper depth for planting wattle seed. The experimental sowing was at an average depth of four inches, and, despite the protracted drought after sowing, the results, it is said, have been most satisfactory. Upon the question of the depth of sowing there is plenty of scope for enquiry in this often drought-inflicted country. On page 759, Vol. 1, there is an interesting account of deep sowing of lucerne in South Australia. The proper depth for lucerne seed is supposed to be an inch at the most, but the writer of the account relates that in spite of all his efforts he could not make his old-fashioned drill work efficiently at a less depth than three inches. The year 1896 was a dry one, 14 inches of rain against an average of 20 inches, and worst of all

there was practically no rain whatever for four months after sowing. He gave up hope of getting anything from the 80 acres he had planted. In January, 1897, there fell a good thunderstorm and the lucerne came away splendidly. In the following April he fattened 300 wethers upon it, and later he had 1,000 wethers in the field for a month. The evidence of Messrs. Holley Brothers and of the South Australian appears to point to the advisability of planting at a much greater depth where droughts may be expected than is considered proper in humid climates.

WHEAT FODDER.—In East Griqualand wheat is the favourite winter fodder. It has completely displaced winter oats, formerly, until the rust epidemic, the main stand-by for winter. When in that district last year Mr. Graham Hutchinson was so struck by the excellence and popularity of a wheat locally called "German," that he decided to give it a trial on his farm Boschfontein. Owing to a delay in the delivery of the seed he did not plant till the middle of May, but even with that late planting he got a good crop for winter grazing. It was perfectly free from rust. In his locality—near Balgowan—it should, he says, be planted in March. Some of his neighbours, against his advice, planted it this year in January; the crops rusted badly—the year, of course, was an exceptionally bad one. The grain is small and dark, and for sowing goes a long way—one bag to four acres. It is ready for reaping at Christmas. Until a few days of that time his crop kept beautifully clean, but then it badly rusted. His opinion of the wheat is very favourable, but he thinks its rust-resisting powers are overstated. In the colder districts of the Colony, having a climate resembling that of East Griqualand, he believes this wheat would be found to be of much value. In East Griqualand, Mr. Hutchinson says, "they swear by it."

ENGLISH RAILWAY RATES.—We have at various times drawn attention to the facilities and favourable rates extended by certain English railways for the conveyance of agricultural produce. The Great Western Company have recently

issued a pamphlet describing the advantages they have decided to offer to the producers and consumers of what comes from the country. The C.O.D. system is not easily applicable in an old country which has its settled social and commercial conditions, and can only be introduced gradually, but the Company to which we have referred is doing what may be described as next best in bringing producers and consumers together. Products such as eggs, butter, cream, poultry, game, fruit, vegetables, etc., are conveyed by passenger train for 50 miles at 6d. for 24 lbs., and delivered to the consumer. Double that quantity is conveyed also by passenger train 30 miles and delivered to consumer for the same amount—sixpence. The Great Western are also offering specially low rates for agricultural produce sent in quantities of 5 cwt., and lower still for quantities of 10 cwt. per passenger train. The Company urges farmers to combine where practicable in order to obtain the lowest rates, and state in the pamphlet that they will gladly send a representative to any district served by their railway to confer with the farmers with the object of facilitating such combination. Other lines, such as the Great Eastern, offer specially attractive rates and conditions for farm produce, particularly in the matter of supplying variously sized packing cases at the lowest cost price: see page 713, Vol. 1. As regards rates, those of our own railway do not compare unfavourably, e.g., 25 lbs. from Maritzburg to Durban 9d., and from Estcourt to Durban 1s. 3d.

GOVERNMENT COLD STORES.—The Government cold stores at Maritzburg are now open for public use. So long as colonial beef and mutton keep their present value it is not probable that one of the great benefits—that of storing fat meat killed in the autumn for sale in the winter and spring—will be much taken advantage of. Colonial mutton a few days ago was selling as high as 1s. 2d. per lb. The Government stores, as we have already explained (see page 496, vol. v.), are constructed on the most modern principles. People who buy imported frozen meat are astonished at the excessive moisture in the meat. This moisture is largely absorbed from the freezing chambers of the stores where it was originally placed, those stores being chilled by the direct expansion method; the ammonia pipes are carried through the chambers and throw off moisture. At the local Government stores the chilling of the chamber is done by air, and in consequence the storage atmosphere is practically free of moisture. For administrative purposes the Stores are under the control of the Railway Department. The "Federal" meat importing company has already engaged 20,000 cubic feet of space. When required there can be a daily output of 8 tons of pure ice—from distilled water. Mr. A. B. White has been appointed manager, and communications respecting storage requirements and rates should be directed to him. A booklet of 8 pages, containing the regulations and a schedule of the charges, can be obtained on applying to the manager, P.O. Box 183, Maritzburg.

Destruction of Insect Pests in Grain, Etc.

THE Director of Agriculture has forwarded for publication the subjoined Report, together with the following Minute:—

The preservation of seeds of all kinds from insect attacks by means of bisulphide of carbon is very simple, and is applied on a large scale in America and Australia. I had certain doubts about the effects of the process on the germina-

tion of the seed, but I had the matter put to the test at the Central Experiment Farm, with results as now reported. Bi-sulphide of carbon is at present somewhat expensive in Natal, but there is nothing to prevent its being made locally in large quantities if a sufficient demand should arise, and being sold at a cheap rate.

The proper method of using the

material is to put it in a dish on the top of the seed, which should be preferably in an air-tight bin, or other receptacle. The material volatilizes and permeates through the mass of seed. The amount to use is about 1 lb. of bi-sulphide to 15 muids of seed in a closed air-tight bin or receptacle, and about twice the amount in an open receptacle. The vapour is poisonous and also inflammable, forming an explosive mixture with air. It should, therefore, not be breathed, and no light should be brought near it.

Central Experiment Farm,
12th May, 1903.

FARM MANAGER,—

I beg to report, in reference to the experiments with bi-sulphide of carbon for destruction of weevils in seeds, and the effect of that chemical on the seed itself; that seeds of wheat, peas, 3 varieties; beans, 4 varieties; mealies, 2 varieties, and turnips, were placed in air-tight jars, and the chemical in quantities of $\frac{1}{2}$ teaspoon, 1 teaspoon, and 1 desert-spoonful, was placed in shallow receptacles resting on the top of the seed. The jars were kept closed for 3 hours, 6 hours, and 16 hours, when they were opened. The seeds were sown, some in tins and some in the open ground, with control plots of untreated seed of the same

varieties. The percentages of treated seeds which germinated and grew were as follows:—

Sown in the open:—

Beans treated, 100 per cent.; not treated, 100 per cent.
Peas treated, 95 per cent.; not treated, 100 per cent.
Turnips treated, 100 per cent.; not treated, 100 per cent.
Mealies treated, 80 per cent.; not treated, 80 per cent.
Wheat treated, 95 per cent.; not treated, 97 per cent.

Sown in tins:—

Peas treated, 85 per cent.; not treated, 80 per cent.
Wheat treated, 60 per cent.; not treated, 58 per cent.

In every case the treated seeds appeared overground before those not treated, though the difference was only slight, varying from 6 to 18 hours. In every case the weevils were all killed in from 20 to 23 minutes after applying the chemical. At present I have a further experiment in hand, on which I will report in due course.—Yours faithfully,

T. M. WHELAN,
Field Experimentor.

Redwater Inoculation.

By LOUIS D. GILSON.

WE have had so much redwater this season, even among stock that have never left the farm on which they were born, that I am tempted to give the results of some experiments I carried out, and do so with the hope that perhaps the Veterinary Department will take them up and conduct a series of exhaustive trials, as I am convinced that the prevention of redwater lies in inoculation. Inoculation has been successful in the Cape Colony, although I am aware that it is condemned by the Natal vets.

In the first place, I must state that my farm is infected with redwater, and raw

cattle brought here invariably contract the disease. On the 16th February, 1902, a cow I had bought sickened with redwater, and was as near death as she could well be without crossing the line. From this cow I have drawn all the blood I have required. On June 1st, 1902, I took two young oxen from a lot of 22 bred on a raw farm near the Berg, and injected them both with 10 c.c. defibrinated blood. Their temperatures then were 101 degs. and 99.2 degs. respectively. There was no variation to speak of till the eighth day, when their temperatures rose to 103.1 and 103.4. They stood at this for two days, and then

the temperature gradually declined to normal. They were both visibly sick during the two days, although they were never off their feed. These two cattle, together with the remaining twenty, were then sent down to the bush veld. The latter soon began to sicken, and shortly two were dead of redwater. The remaining 18 were then inoculated; one more died that must have been already infected, and the disease then stopped.

On the 28th June, 1902, I bought 3 Hereford cattle from a notoriously raw farm, and on the same day I injected 10 c.c. of defibrinated blood into each. The temperatures remained about 101 till the ninth day, when the cattle stood at 103.4, 101.2, and 102. On the tenth day 105, 104, 103.2; eleventh day, 106, 104, 105. The temperatures then varied between 104 and 106 till the fifteenth day, when, in the case of two, they declined to normal. The third case was normal on the thirteenth day, but on that day she was attacked by what appeared to me to be epilepsy, and after a succession of fits died in three days. However, on making a *post mortem*, I found symptoms of redwater, so concluded it was only a variation of the disease. On the 6th November I got out some cattle from England, among which were four Shorthorn bulls and two North Devons. I inoculated them all with about 13 c.c. defibrinated blood. The two Devons were sent to the bush veld at once. In this case the reaction came on the fourth day, owing, I suppose, to the greater susceptibility of the imported cattle, and for the next six days the temperature was about 105. On the fifteenth day there was a second rise of temperature to 104 in every beast, which lasted for four days. They were then all turned out on to the veld, where they have been ever since. In February one of the Devons died from black gallsickness. I have had 25 cases of redwater, with six deaths, among my Colonial cattle this season, and these imported bulls have run among them all this time. I may mention that the day the cattle landed in Durban I had them well creased with castor oil and Hayward's dip, and kept them so till the

temperature had finally fallen, so as to guard against any infection by ticks. The only medicine I used in all these cases was a powder I got from Mr. Verney, D.V.S., made up, I subsequently learned, of quinine, sulphur, and bi-carbonate of soda. I am so certain that this inoculation is the right line to follow with imported cattle, that I am landing another lot next month and shall treat them in the same way. Dipping may be, and no doubt is, a preventative against redwater, but, as far as I can see, unless it is systematically done throughout the whole country, the man that does dip his cattle will certainly find that he has eradicated redwater, and that he is in possession of an absolutely raw troop of cattle, and that he dare not move one beast off his land except for immediate slaughter, as, to do so, would be certain death to the beast.

Klip Rug, Griqualand East.

COMMENTS.

By H. WATKINS-PITCHFORD, F.R.C.V.S.

Mr. Gilson's experience in the treatment of redwater as narrated in his letter is interesting although naturally somewhat deficient in detailed description.

It has long been recognised that susceptible Colonial cattle could successfully be treated by inoculation under certain conditions, and this operation is to be recommended in cases where it is intended to remove cattle to a dangerous Redwater locality, provided the operation is intelligently carried out at the right time of the year, and the effects carefully watched. We in Natal have abundant evidence of the safety of the immunising process.

The immunity can be maintained by the occasional re-inoculation of suitable blood until a high degree of resistance is reached, and the acclimatisation of the animal is complete.

Where this secondary treatment is omitted and the animals are turned out on the subsidence of the primary reaction and considered immune, it will be found that relapses are of frequent occurrence, and are often so severe as to prove fatal.

The statement in Mr. Gilson's letter that he has had 25 cases of redwater and six deaths amongst his Colonial cattle this season may be an instance in point.

The treatment of European stock, however, is a more serious matter, as they seem to possess a much lower power of resistance to the disease, and are less tolerant of experimental methods. Age is a great factor here, and it would be interesting if Mr. Gilson had told his readers the age of the six bulls he imported. There seems no doubt, however, that a considerable degree of resisting power has been conferred upon these animals by the inoculation, although the statement that one of them died subsequently from black gallsickness is signifi-

cant. It will be interesting to hear Mr. Gilson's experience at the end of the coming autumn, particularly as he is importing another lot of cattle next month.

To judge the severity of any reaction to experimental treatment I may remind him and others who are interested that a more important and more severe reaction takes place about the thirtieth day after inoculation, when the animal is considered safe by reason of the primary reaction having subsided.

The question of the immunisation of imported stock is of the greatest moment to South Africa, and is not being lost sight of by the Government.

Milk Panniers.

DEAR SIR,—It would much oblige me if you could give a description in your esteemed Journal of horse panniers suitable for the transport of milk to the railway station, or where they can be procured.

I have heard suitable ones can be constructed with the use of an old saddle, but have been unable to procure exact particulars of them.—Yours faithfully,

TRANSPORT.

Lidgetton, 19th May.

[Milk cans may be put in sacks, and,

if the sacks are tied together at the mouths and thrown over the saddle of the horse, the load will carry all right. The weight of the cans must, of course, balance. "Transport" will be able any day to see this system in practice at Balgowan or Mooi River, in his neighbourhood. In Switzerland and other Continental countries special saddles and cans are used. I have written to the Agricultural Department of Switzerland for information on this subject, and as soon as it is received I shall publish it.—
ED. O. CHALLIS.]

Agricultural Shows.

Umzinto, Thursday, 18th June. Entries close 13th June. Hon. Acting Secretary, R. G. Archibald.

Maritzburg, Thursday, Friday, and Saturday, 18th, 19th, and 20th June. Entries (to be made to Messrs. Duff & Eadie, Assistant Secretaries, 19, Timber Street) close 4th June; late entries 11th June. President, Sir T. K. Murray, K.C.M.G. A. Whittle Herbert Hon. Secretary. Ladysmith, Wednesday, 15th July. H. B. Cawood, Hon. Secretary.

Richmond, Thursday, 30th July. President A. W. Cooper, J.P. Hon. Secretary, John Marwick.

New Hanover, Friday, 24th July. Entries close 11th July. T. B. Train, Secretary.

Mid-Illovo, Wednesday, 5th August. Entries close 15th July; late entries 20th July. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buelow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 5th June. Secretary, W. E. Allcock.

Report on the Cattle Disease in Southern Rhodesia.

By Professor R. KOCH.

FIRST REPORT.

(From the "Natal Government Gazette.")

I have the honour to submit herewith my first report, embodying my observations and investigations with regard to the cattle disease existing in Rhodesia, in response to your telegraphic request of the 17th instant.

Having received a letter from the British South Africa Company on December 24, 1902, authorising me to proceed to Rhodesia, *via* the East Coast, I left Berlin with my two assistants, Dr. Neufeld and Dr. Kleine, Army Medical Department, on January 12th, 1903, and landed at Beira on February 18th. On the way I availed myself of the opportunity to make investigations and enquiries at the various Ports at which the steamer called along the East African Coast, at Mombassa, Tanga, Zanzibar, Dar-es-Salaam, Kilwa, Ibo, Mozambique, and although the stoppages were brief, I was able to collect valuable material, throwing much light on the subject of the Rhodesian cattle disease, to which I will refer later.

In Beira I was met by Mr. Gray, Chief Government Veterinary Surgeon of Rhodesia, and Colonel Beal, Assistant Manager of the Beira and Mashonaland Railways, who kindly arranged everything to enable me to proceed without delay to Umtali.

Mr. Gray gave me every information about Beira, and about the first outbreak amongst the imported cattle from New South Wales at the end of 1900.

On the afternoon of the day on which we arrived, we visited the farm of Mr. Martini, outside Beira, and inspected his cattle, which were of interest, inasmuch as they had grazed alongside the Australian cattle, and sometimes even mixed with them.

We then proceeded to Umtali, where we arrived on February 20th. Here we

saw the first case of the disease in a calf, the survivor of a large herd, but we could carry on no further investigations here, as the disease had spent itself and only a very few head of cattle were left.

A similar state of affairs existed in Salisbury, where we also saw some cases, but as at Umtali the epidemic, after having killed off nearly the whole stock of the township, had temporarily abated.

This being the case, we therefore decided to proceed to Bulawayo, where the disease had broken out only some months previously, and where there is every likelihood that for some time to come suitable material for the study of the disease will be found.

The Hillside Camp, 1½ miles outside Bulawayo, which was erected two years ago for the accommodation of the Rhodesia Field Force, but which is now unoccupied, affords an excellent site for a Laboratory and for housing experimental animals, although some alterations are necessary to prepare stables in which healthy animals can be kept without danger of infection, by no means an easy matter in such a highly infected neighbourhood. I expect, however, the work of carrying out these alterations will be so far advanced in the course of a few days, under the expert supervision of Mr. Gray, that experiments with healthy animals, with a view to conferring immunity, can be commenced by placing as many infected animals as possible under observation.

Meanwhile we have lost no opportunity of studying the disease by observing its course in sick animals, by making *post mortems*, and by examining the various organs therefrom for the characteristic lesions produced by the specific parasites, and we have also studied the connection of the ticks with the disease, with a view

to forming an opinion as to the cause of this epidemic.

Up to now we have had under our care 22 infected animals; 19 of these have died, and upon 18 we made most careful *post mortems*. Of those surviving, two are very sick and will probably die of the disease, while one appears to have some chance of recovering.

These figures show what an extraordinarily high mortality characterises this disease. In Umtali, of 4,000 head of cattle scarcely 200 survive, and of the New South Wales imported animals (about 1,000) none are now alive. The general opinion is that the percentage of mortality amongst infected animals is from 80 to 90, almost as high a death rate as that of Rinderpest.

The symptoms of the disease and the *post mortem* appearances in our cases correspond to those given in the most excellent report of Messrs. Gray and Robertson on Texas Fever or Redwater in Rhodesia, and therefore I do not think it necessary to enlarge on these at great length again.

From the beginning it was noticed by all observers that the Rhodesian disease was very similar to that which attracted public attention first in North America, later also in Australia, South Africa, South America, and Europe, and characterised generally as Texas Fever.

The occasional appearance of haemoglobinuria (Redwater) and the existence of pear-shaped parasites in the red blood corpuscles led to the conclusion that the Rhodesian disease was identical with Texas Fever, or at least one closely allied thereto, although more virulent; but if one gives the Rhodesian disease a careful consideration, important differences appear, which, I think, are even more important than they have been considered to be by the majority of observers.

Regarding this, I wish to call attention to the following facts:—

In Texas Fever there appear in the red blood corpuscles and in its initial stage, without exception, the large pear-shaped twin parasites so characteristic of this disorder, and in the course of the

disease a great number of red blood corpuscles perish so that their normal number, which is 6-7 millions in the cubic millimeter, will sink to 2-3 millions, and even less, and through the destruction of so many red blood corpuscles, much of their colouring matter is liberated, discolouring the blood serum, and when this is excreted by the kidneys it gives rise to the condition known as haemoglobinuria or Redwater. Besides this, through the loss of so large a number of red blood corpuscles an important anaemia results, which is most characteristic of Texas Fever, and upon this anaemia the subsequent symptoms and *post mortem* appearances depend.

It is quite different with the Rhodesian Fever. Here, too, we have found blood parasites, as proved by the microscopic examination of the blood of every sick animal submitted to our scrutiny, but these are of different shape and considerably smaller than the pyrosoma of Texas Fever.

In the early stages of the disease they are, as a rule, not very numerous, but their number increases from day to day, so that ultimately in each or in every other red blood corpuscle there are one or more small parasites. In the first days of sickness only red shaped or very small ring-shaped parasites are observed, but if the animals remain alive a little longer, a number of somewhat larger parasites make their appearance; these are disc-shaped or resemble a leaf in outline. Only in exceptional cases, and after a prolonged period of illness, do we find, in addition to the smaller organisms, some bigger pear-shaped parasites. Amongst our fatal cases here we have only observed one in which the number of parasites present in the general circulation remained low throughout the course of the disease (about 1 parasite to 6 blood corpuscles). In all the other cases the parasites were very abundant. Only in four cases were the pear-shaped parasites observed; in two of these the disease lasted a comparatively long time (from 15 to 16 days); in the other two the duration of the disease could not be assured.

Another difference exists, and is that although the red blood corpuscles are numerically more abundantly inhabited by parasites than they are in Texas Fever, there is not the same destruction of these, and consequently not the same reduction in their number that there is in this disorder.

In a number of cases in which Mr. Gray undertook daily to count the number of blood corpuscles, it was found that in some cases no reduction whatever of their number could be observed. In other cases again oscillations in the number of blood corpuscles were observed in which the decrease did not go under 4,500,000 per cubic millimeter. Only in one instance did the number of blood corpuscles fall to 4,200,000, and in another to 2,380,000. As a consequence of comparatively small destruction of blood corpuscles we only exceptionally observe haemoglobinuria.

Amongst our cases only once was a characteristic haemoglobinuria observed during life, and that was in the case of the animal in which the number of blood corpuscles was most diminished, while in a second case, in making the *post mortem*, a light reddish urine was found, in which spectroscopic evidence of the presence of haemoglobin was forthcoming. These were the only cases of haemoglobinuria which we saw.

From the evidence before us, it would appear that in this disease comparatively few blood corpuscles perish, therefore no remarkable anaemia such as characterises Texas Fever is likely to set in.

Further, the Rhodesian Fever possesses certain *post mortem* phenomena which are absent in Texas Fever, namely, local lesions in certain organs which indicate that the parasites accumulate in these parts in enormous numbers, injuring the tissues and obstructing the circulation. To this cause may be ascribed the most characteristic lesions of this disease, the infarcts in the kidneys, lungs, and liver, the swollen and haemorrhagic condition of the different groups of lymphatic glands (the crural, tracheal, mesenteric, portal, bronchial, and mediastinal glands) and the appearance of local oedemas, es-

pecially in the lungs, from which the peculiar frothy effusion occasionally observed results. That this is caused by the action of the parasites is proved on microscopic examination, as we find in all these different parts the organisms are unusually abundant, and there we have observed a peculiar form which up to now has not been described, a form which leads to the conclusion that here an increase of parasites takes place.

I am of opinion that these differences are sufficient proof that the Rhodesian Fever, although allied to Texas Fever, and belonging to the same class of diseases, is still a distinctly different disorder, and we may ultimately find that in pyrosomal diseases of cattle we have to deal with a class of disease related to one another in much the same way as the various types of human malaria, formerly classified as one, but which we now know to be caused by infection with the different parasites of the Quartan, Tertian, and the tropical types of Malarial Fever. We must, therefore, in describing such pyrosomal diseases of cattle discriminate clearly between Texas Fever and Rhodesian Fever, because in these two diseases the causal parasites, the symptoms to which they give rise, and the pathological changes in the organs, are different.

Bearing out my opinion that the Rhodesian Fever is a specific disease, I may instance another fact considered of considerable importance at the present day in the classification of infective diseases, and this is that it has been proved through direct experiments by Gray, Robertson, Pitchford, and Theiler, that cattle from Natal and the Transvaal, which are, as we know, immune against Texas Fever as existing in Natal and the Transvaal, and even cattle from Texas itself, will catch the Rhodesian Fever and die of it. Were the two diseases of exactly the same character, a complete or at least a certain degree of immunity should have been manifested; but this is not so, therefore they cannot be considered identical, nor is the view that Rhodesian Fever is merely more than an unusually virulent form of Texas Fever a tenable one. Yet another theory has been propounded,

and that is that the Rhodesian Fever is not one disease, but a complication of diseases; but in support of this there is no evidence whatever. In the blood of animals examined by us we only found the small parasites characteristic of this disease, and always in such abundance that the course of the disease and the death of the animals could be ascribed to their presence without any hesitation, and there was no necessity to entertain any theory of the existence of any mixed infection.

The question is now if this apparently new disease has arisen in Rhodesia, or if it was imported from some other place? and to answer this question I must endeavour to trace the history of this outbreak.

At the end of 1900 about 1,000 head of cattle for Rhodesia from New South Wales were landed at Beira, and because they could not be forwarded by rail at once they were sent on the veldt for grazing there. They grazed in the neighbourhood of Mr. Martini's farm, and mixed with his stock, which were to all appearances in perfect health, and which remained so. Two or three weeks later the disease broke out amongst the Australian cattle which were then sent to Umtali, and carried the disease with them.

But how could the Australian cattle become infected?

In New South Wales no such disease is known, and no mortality occurred amongst these animals during their voyage from Australia. There was also no apparent disease in Beira.

The problem would be well nigh insoluble if there was not one piece of evidence in our possession which I became cognisant of some years back, namely, that the same disease exists on the East African coast as has now broken out in Rhodesia, and that in German East Africa the disease was carried inland in a similar manner to that in which it may have been brought from Beira to Umtali.

The stock on the coast of German East Africa are apparently quite healthy and in the best condition, but as soon as other cattle are brought there from clean districts, for instance from the inner parts

of the country, and graze on veldt on which the cattle from the coast have been grazing, these imported animals will get sick and almost all die.

The indications of this disease are the same as those of Rhodesian Fever, and in the blood of these infected animals, which I have many times examined, I have always found the same small blood parasites which I have again seen at Umtali, Salisbury, and Bulawayo.

On the voyage out I have had an opportunity of examining three animals, which only a few weeks previously arrived at the coast of German East Africa from the interior, and which were showing the first symptoms of the disease, and whose blood contained the characteristic blood parasites present in Rhodesian Fever. My assistants also found the same parasites in the blood of several sick animals at Zanzibar. Six years ago, at Tanga, I saw an outbreak of exactly the same character as the present Rhodesian one, although of smaller dimensions. In this case a herd, which was brought into the infected area at Tanga, and which became infected there, carried the disease thence to Mohesa in the interior.

From enquiry which I made, I gathered that this disease has been indigenous for generations back in German East Africa and the neighbouring Islands, and I have good reason for supposing that it also extends still further Southwards along the Coast, and in all probability it also exists in Beira. In Beira I was informed some time ago cattle were frequently brought there from German East Africa and Madagascar, and that the latter animals, especially when they came from the South of the Island, soon became sick and died, while the cattle from the East African Coast and the Northern districts of Madagascar remained healthy.

To verify these statements, to see if the cattle from German East Africa and from Beira are immune against Rhodesian Fever, which should be the case if my views are correct, I consider it is well worth while bringing a few cattle from German East Africa and from Beira to Bulawayo, and to be tested here as to their immunity.

In conclusion, it seems to me a very reasonable explanation of the cause of the present Rhodesian outbreak is to assume that the highly susceptible Australian cattle landed at Beira, which belongs, I believe, to the infected coast district, became infected there, and carried the disease with them to Rhodesia.

I am of opinion that there is also good reason for supposing that the infected area extends still further South to Delagoa Bay, as for some time past the Transvaal has been invaded from its South-eastern Border by a slowly spreading disease affecting cattle, which appears from all accounts to be very much like Rhodesian Fever. Mr. Theiler, Government Veterinary Bacteriologist, Pretoria, whom I asked to send me some blood preparations from infected parts of the Transvaal, most kindly complied with my request, and we have been able to prove that in the preparations from different parts of the Transvaal (from Nelspruit, Herdepoort and Mooi Plaats) exactly the same blood parasites are to be found as are present in the blood of animals affected with local Rhodesian Fever; therefore there can be no doubt that the same disease exists in the Transvaal as that prevails in Rhodesia, but when we take into consideration the position of the infected districts of the Transvaal, and the obstacles to communication which have existed, and which still exist, the view that the disease extended thither from Rhodesia is, I think, quite untenable. What is very likely, however, is that the disease obtained a foothold in the Transvaal in much the same way as it did in Rhodesia, that is by being imported from the coast, in the one instance from Beira and in the other from Delagoa Bay. In appearance in Rhodesia the disease has conformed to a natural law which it has often followed at other times. It has been brought inland from the infected coast districts as it has previously been in many other instances, and therefore it appears to me much more reasonable to call it "African Coast Fever," in preference to calling it "Rhodesian Fever."

Taking these facts into consideration,

it is advisable that those Ports on the East African coast, which are now used as ports of entrance for the introduction of cattle to the interior, should be carefully examined, in order to ascertain whether or no they are infected with "African Coast Fever," and those which are so infected should be closed against cattle, or the entrance of these animals should only be permitted under such conditions that the importation of infection from the coast to the interior is rendered impossible.

Another important question which arises in connection with the present epidemic is whether anything like lasting immunity against the disease exists in such animals as have recovered from an attack of the disease. It is known that immunity against Texas Fever exists, but whether there is any lasting immunity to the Rhodesian Fever seems doubtful, as in the report of Gray and Robertson they state, "the few animals which recovered from a first attack in many instances developed a second attack about three months later which terminated fatally," and we also saw a case in Salisbury which ended in the death of the animal, which we were assured had got over the disease some months ago. This does not look as if we would reckon upon immunity, but still I am convinced that such a thing exists, because we have had an opportunity of seeing and examining a considerable number of animals which have recovered from the disease, and although they have been grazing for some time on infected veldt, they have not sickened again, and must therefore be considered immune against natural infection.

A most interesting feature of the examination of these animals was that although they appeared perfectly healthy, and did not show the slightest variation in temperature, their blood contained a small number of parasites which can only be demonstrated satisfactorily by the use of a staining reagent (Azur II.) which, like Romanowsky's method of staining for malaria, colours the Chromatin in the parasites a dark red. By this staining method every single parasite can

be identified with certainty, and it is to be hoped in this manner immune animals can be easily and certainly recognised. An immunity of this description against Rhodesian Fever, which is characterised by the presence of a small number of parasites in the blood, resembles very closely that existing against Texas Fever, as here, too, parasites exist in a certain number in the blood of immune animals, as the reaction following inoculation with their blood proves. The existence of such parasites in the blood of an apparently healthy animal may be taken as an indication that such an animal is not inconvenienced by their presence, therefore must be immune.

As we know that in the pyrosomal diseases whereto the Rhodesian Fever belongs, ticks play a most important part as agent for the dissemination of infection, I have occupied myself thoroughly with this side of the question. For this I have had special facilities, as in my earlier work on the pyrosomal disease at Dar-es-Salaam, which I have identified with Rhodesian Fever, I reproduced it with infected ticks in the far distant Usambara Mountains, and so proved that the ticks are also the intermediary agents in this disease.

Putting on one side a few rare species of ticks, I have found the cattle ticks in Rhodesia to be of the same species which are described commonly as throughout South Africa. They are the following:—*Rhipicephalus decoloratus*, *Rhipicephalus Evertsi* and *Hyalomma aegyptium*, and to these we must add the *Rhipicephalus sanguineus*, which is the most common tick in Rhodesia. In Umtali we found also *Amblyomma variegatum* frequently on cattle, and now and then we found *Haemaphysalis Leachi*, of which the dog is the usual host.

Of real importance amongst these ticks there are only the different species of *Rhipicephalus*, and of these most particularly the *Rhipicephalus decoloratus* or Blue Tick, because this insect is most closely allied to ticks which in America (*Rhipicephalus annulatus*) and in Australia (*Rhipicephalus australis*) carry the

Texas Fever, and also because it is known to be the tick which disseminates Texas Fever in South Africa. For this reason we may suspect that *Rhipicephalus decoloratus* is also the intermediary agent in Rhodesian Fever. Up to now there have been no direct experiments made, and there is a possibility that the other two species of *Rhipicephalus* may also act as carriers. Experiments have already begun to decide this question.

With regard to the *Rhipicephalus decoloratus* it is known that it differs from the American and Australian species, in possessing only six rows of teeth on his sucking apparatus (labium) instead of the eight rows common to both the others. Up to now the general opinion was that the area for the *Rhipicephalus decoloratus* on the East African coast extended far to the North. I therefore made a collection of ticks at the various ports of call on my journey down the coast, and found that from Mombassa to Beira, with exception of the Island of Ibo, everywhere specimens of *Rhipicephalus* were obtained, and amongst these a kind which would appear to a casual observer to resemble the *Rhipicephalus decoloratus*, but which on more careful examination were found to have eight rows of teeth, and is therefore more closely related to the American and Australian varieties than the African *Rhipicephalus decoloratus*. This species is found all along the East Coast of Africa as far South as Beira, and I suspect it may also exist in Delagoa Bay and beyond. Of the real *Rhipicephalus decoloratus* I have not found a single specimen on the coast, but in Rhodesia, as far as my investigations went, only the *Rhipicephalus decoloratus* with six rows of teeth exists. Nor have I found in Rhodesia any specimens of the eight-rowed coast species. This fact goes to prove that in carrying the disease from Beira to Rhodesia the Australian cattle only brought to Umtali the parasite which produces the disease, and not the coast tick which carried it, but unfortunately it turned out that there was already in Rhodesia a variety of tick, probably the *Rhipicephalus decoloratus*,

quite as capable of acting as a carrier as is the coast *Rhipicephalus*.

Lastly, I come to the question of how the disease will further develop and in what way we can combat its spread. If nothing could be done against the disease it would, without any doubt whatever, permanently infect every locality in which it breaks out, and in time the whole of Rhodesia will suffer as severely as Umtali, Salisbury, and other places have already done.

There will be only 10 to 20 per cent. of the cattle left alive, but these animals will be immune, and will be progenitors of an immune breed which will thrive in Rhodesia as they do now on the coast. The same situation will be developed as now exists in the Southern States of North America, in Queensland, and on the East African coast, the locally bred cattle will not become visibly sick, they may appear strong and healthy, but the progeny of ticks reared upon such animals will be pathogenic for cattle which come from clean countries. This state of affairs can hardly be considered a satisfactory one. Besides this there is to be feared that this natural immunising process will progress very slowly and fitfully, and as a result the cattle-breeding industry in Rhodesia will not develop materially for many years to come. As this is the alternative, it is absolutely necessary not to let the pest take its own course, but to fight against it by every means in our power. A radical measure would be the destruction of all ticks, but this has been attempted for years in the Texas Fever countries, but unfortunately without marked success, because, while it is possible with the help of dipping tanks and sprays to destroy most of the ticks on an animal, some remain as we have noticed on a few regularly dipped cattle here, and very few ticks will suffice for the production of a large number of young ticks, which will ensure for further spread of the disease.

Therefore experts in North and South America, as well as in Australia, came to the conclusion that it would be well to protect the animals against the sickness

by inoculation. At first these inoculations were not always satisfactory, as sometimes the blood used for inoculation purposes was too weak to protect or too virulent. It was only when blood could be obtained from such immune animals as gave a sufficiently severe reaction to confer immunity, and when this standard of virulence could be maintained, that produced satisfactory results were forthcoming. Such a line of action must be adopted to combat Rhodesian Fever, and our endeavour must be to find a suitable virus, a matter of no little difficulty, on account of the extreme virulence of the Rhodesian Fever, and when once the fact is ascertained that natural immunity to this disease actually exists, there is no doubt the line of treatment necessary to produce immunity artificially will be forthcoming sooner or later.

What remains to be done is to discover a standard virus of such a strength that it will confer a maximum immunity with a minimum of loss from inoculation. Should such a virus be unobtainable by any other means, then an effort must be made to attenuate the virulence of the parasite for example by passages through animals other than cattle, or in some other method by which we may hope to procure the desired protection. That this is possible is shown by the fact that the experiments which I formerly made in East Africa accidentally placed in my hands a method of immunisation to which I subjected certain cattle which subsequently resisted natural infection when exposed thereto.

Of course it is my intention to do my utmost to obtain a suitable stock vaccine as soon as possible.

I will experiment simultaneously in many different lines in order to save time, and for the purpose many healthy cattle will be required.

The more animals we have for this experimental work the sooner we may hope to bring our labours to a satisfactory termination.

(Signed) R. KOCH.

Hay Slipping.

IN this issue we have the pleasure of giving a plan of what we believe to be an admirable hay-slip. These slips are known in certain districts, but in most cases they will be found defective and inefficient in comparison with the slip of which we give a plan. The plan has been prepared from an inspection of the slip now being used by Mr. F. H. Powdrell, of Wilgefontein, and from several consultations with the owner. A double strong wire is sometimes used for hauling hay, but it is attended by many disadvantages. Wagons are also used for collecting hay as in Europe, but a wagon is the most ineffective implement of all. A wagon requires five boys, the pitching up of the hay is heavy work, the load requires roping, and amounts to only a ton and upsets would be constant if the wagon were driven over ground such as slips travel easily. A good slip on the other hand will take four, five, or even six tons of hay on fairly level ground in charge of a driver and two voorloopers only. There is no loading or off-loading; the slip gathers up the hay-cocks, proceeds to the stack, the teams are turned round, and in a minute the slip is again on its way to bring up further supplies.

Although the plan, in essentials, is self explanatory, a few words with regard to details may be acceptable. The wood should be of hard character, stinkwood would probably be the most suitable. There should be no iron sole of tire-iron, for that would impede the extraction of the ends of staves or props in the event of any getting broken. The wire at the top of the staves should run through holes to give a little play, and the wire should be of the soft kind used for clothes lines. The team on either side should be of eight or ten oxen, and between each span and the ends of the slip there should be an extra length of trek chain. On the inside of runners—of course both sides may be inside—a row of pointed spikes, say 4 inches long and 4 inches from the ground, would be found of service in getting a hold of the first lot of hay. In gathering up this first lot there is always an inclination of the slip to run over it. This is counteracted by the driver standing on one of the arms in order to weigh it down. The difficulty, in Mr. Powdrell's opinion, would be wholly obviated by the addition of the spikes as described.

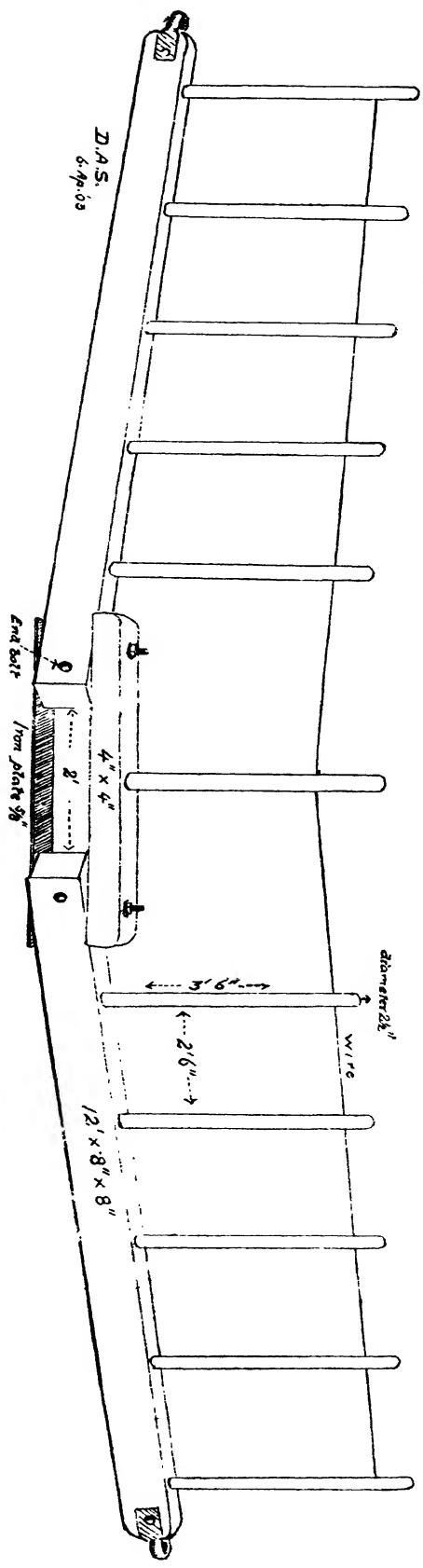
Cape Regulations for the Import of Fruit Trees, Etc.

By CLAUDE FULLER, Government Entomologist.

SUBJOINED and addressed to the Editor of the *Agricultural Journal*, by a Mr. Weaver, of Durban, is a letter which has been drawn from the correspondent by the appearance in these pages of the revised regulations for the import of trees, etc., recently put into operation in Cape Colony. There is so much in Mr. Weaver's letter that is calculated to mislead, and so much that impugns the policy of this Department as well as that of the Cape, that it is impossible to give it publicity in these pages without some sort of criticism. It is well to bear in mind, in reading the communication, that, for the past eight

or ten years, regulations, almost as stringent, have been in force in Cape Colony, and that for three years very similar ones have been in operation in Natal.

Their application is inexpensive, costing about £40 per annum in Natal and perhaps a little more than £100 in Cape Colony. The number of inspectors is regulated by the number of "ports of entry," of which Natal has one, and Cape Colony three or four. These officials are usually Customs Officers who receive some special instruction and an annual honorarium for the work performed.



HAY SLIP (MR. F. H. POWDRELL'S DESIGN).—See Article.

The following is the text of Mr. Weaver's letter:—

CAPE REGULATIONS FOR THE IMPORT OF TREES, ETC.

(To the Editor "Agricultural Journal.")

Dear Sir,—In your issue of May 1st last you print regulations regarding the above.

They are only another example of the grandmotherly legislation that British colonies are so fond of indulging in, and the Cape, as has happened elsewhere, will have to repeal them later on. It, however, a large army of inspectors, with plenty of influence, has been called into existence, the repeal will be delayed as long as possible, with consequent damage to fruit growing and horticulture. These regulations have been brought into existence to prevent the introduction of insect or other diseases. The Cape, however, is, I expect, just as blessed as Natal with these, and Natal seems to be short of "Peach Yellows" only. With regard to this last I am making enquiries into the damage this disease is doing in the States, and I shall not be surprised to find that, in orchards where the trees are properly looked after, its ravages are very small. At the present time Natal can boast of scale, aphid, fungus, and caterpillars. Any pests that can be imported will come under one of these headings, and as you are aware they can all be kept within bounds or eradicated by intelligent spraying. Of course I must except Natal's own special first, the fruit fly. To digress, is our Agricultural Department experimenting to find a remedy for this pest, and, if so, will the Department publish such experiments and results, so that others who may also be experimenting may avoid the failures?

It, therefore, does not matter if any new scale, aphid, etc., arrive here, as they will only add to those already present, and will be dealt with when spraying our own little lot. Some of the largest commercial growers in the States maintain that pests are the result of want of knowledge in growing plants, and Professor F. Wm. Rane, in a lecture, delivered before the Society for the Promotion of Agricultural Science, in New York, at the beginning of this year, maintains they are right. Professor Rane states:—"I have had college graduates who could identify insects, recite on insecticides perfectly, but found it practically impossible to combat red spider, etc., without practically destroying the plants themselves. A man with little knowledge of insects or entomology, but thoroughly understanding plant culture, has grown the same

plants under exactly similar conditions, and I have failed to even find red spider present

The whole of South Africa is years behind other countries in fruit growing. New introductions of first-class fruits do not seem to find their way here. My judgment is based on what I have seen in Natal, in the Transvaal, and at Capetown, and having had the sole management of an orchard in the Santa Clara Valley, California, and also of the orchard of 600 acres of the Burrawong Fruit Company, Ltd., New South Wales, I am in a position to make comparisons. Santa Clara County, in 1894, had over 12,000,000 fruit trees, and produces without doubt the finest fruit in the world. Natal, to obtain trees to produce first-class fruit, must import, and to keep pace with the rest of the world must keep importing continually the latest introductions of improved varieties.

No restrictions whatever should be imposed to prevent the introduction of the best varieties, for even if clean the opening at the wharf would dry out plants to such an extent that many kinds would not recover.

The treatment by fumigation, as provided by the Cape, is ridiculous, and only shows the ignorance of those who advocate it. If used by anyone except a thoroughly "capable" and "careful" man, it will destroy more plants than the disease. I have before me experiments made in November last in the State of New York, which are pretty well up-to-date. It was found that at the greatest strength at which hydrocyanic gas could be used without injury to plants killed only 30 per cent. red spider, and 55 per cent. mealy bug. Fumigation is about dead in the States, and will never come into general use, as its results are so poor compared to spraying. This is the result in the hands of experts, so what would be the result in the hands of some of our budding inspectors? If these inspectors think they know anything about fruit-pests and fruit, let them get on the land and earn an honest living by growing it.

The enterprising grower who is trying to improve the plants and fruit of his country is saddled with the cost of this useless fumigation. He has to pay hard earned cash, and most likely lose good plants, not because the pests would do him any harm, but on the plea that it will protect other growers in the colony. Any grower who is afraid of pests being introduced can only fear them on account of either ignorance or laziness, and such a grower is the great curse of

the fruit growing business at the present day.

There is also the public to be considered in the matter, and it is scandalous the amount of rubbish that is allowed to be sold in our markets.

Natal nurserymen and fruit growers have now a grand opportunity to import the best sorts of fruit trees, and by growing them well their product in the near future will command the markets of South Africa. The Cape, no doubt, will keep these regulations in force for some time, and the longer they last the better for Natal. Anyway, if our fruit growers get to work at once they will have a very good start.

What is really wanted in Natal is an Act, similar to one in California, compelling owners to keep their orchards free of pests, with power given to the Department of Agriculture to destroy trees, at owner's expense, that have not been cleaned after a certain number of warnings have been given. Also to provide for an annual inspection of nurseries, and to issue certificates when clean, and to prevent any stock being issued until such certificate is granted.

No fruit grower understanding his business, and they are the only ones worth considering, will fear such legislation. It is only the ignorant, lazy, or careless that will be affected, and their products are better off the market, as poor fruit, which is perhaps diseased, cannot be good for a person's stomach or health.

Such legislation would result in numbers of worthless trees being destroyed, would raise the standard of fruit all round, and would give the competent grower good returns such as he is entitled to. It should always be remembered that to grow fruit, or anything else, thoroughly, will take years of study, practical experience, and hard work. I hope, Mr. Editor, you will give your readers your views on this subject, and endeavour to awaken their interest. The "Agricultural Journal" is the only paper in Natal that deals with these matters, and farmers of all kinds now look to it for their information. It is criminal the way the agricultural, fruit growing, horticultural, and, in fact, all industries relating to the land are neglected by our "great" dailies. The farmers are usually considered to be the backbone of a country, and I am sure those of Natal do not merit this neglect. —I am, etc.,

F. E. WEAVER.

It is not congenial to have to deal with a communication of which its author has no need to feel proud, nor is

the task of criticism a light one in view of its length and the side issues involved. Some of the chief points may first be glanced at. The class of legislation referred to is stigmatised as "grandmotherly," which is one of those hoary and time-honoured adjectives which have absolutely no meaning. Whatever this legislation may be, however, it is not confined to such dreadful places as "British Colonies," backward as they all are in the eyes of the man who has happened on America. Regulations of a similar and even more stringent nature are in force in practically every State of the North American Union, the one State protecting itself from its neighbour, and the whole combining against the outside world. Certain European countries must also come under Mr. Weaver's "grandmotherly" ban. As regards the rescinding of any such legislation, I challenge the correspondent to cite instances where any such regulations once enforced have been repealed.

The correspondent's remark on the "army of influential inspectors" is puerile and pointless, and made without any idea of the facts of the case.

Regarding the *raison d'être* of such regulations, the correspondent is on the right tack in his surmise that they are destined to prevent the introduction of insect pests and other diseases of plants; but he is very much at sea upon the general subject. In the first place, he regards Natal as "blessed" with every pest but one. It is a popular fallacy that we have every pest in Natal; but this being an exploded fallacy we need not discuss it. As bearing upon it, however, I may say that Cape Colony has pests which Natal has not, and *vice versa*. Would it surprise Mr. Weaver to learn that the Fruit Fly of Natal is different to the Cape species; and, in view of his 600 acre experience in New South Wales (a State the writer has lived in for 24 years), will he deny the mischievousness of either the Codling Moth or the Pear and Cherry Slug—two Cape pests, of which Natal boasts not?

"Peach Yellows" is a disease from which South Africa as a whole is free; and, if the Rules and Regulations prevent but its introduction, they will have

justified their existence and maintenance. I have no wish to use this disease as a "stalking horse," but, as the correspondent has mentioned it, it is only right to state that the disease has done immense damage in the Eastern States of America, and I shall not be greatly surprised if Mr. Weaver's enquiries result in a surprise for him. The correspondent claims that any pest which we may introduce will come under one of the headings "scale," "aphis," "fungus," or "caterpillar." Whilst not necessarily true, for the sake of argument this point may be granted, if simply qualified by the statement that any lion, wolf, snake, or lunatic will come under such simple headings as "cat," "dog," "worm," or "man," and, as most of us are aware, all such can be kept within cages, or eradicated by intelligent marksmanship.

The criticism of fumigation is, let us trust, made without *malice prepense*, and upon but a slight knowledge and conception of the subject. Our correspondent says:—"Fumigation"—and he leads one to infer that he means Hydrocyanic Acid gas fumigation—"is about dead in the States" (of America), "and will not come into general use as its results are so poor as compared to spraying." These remarks are absolutely controverted by facts, and fumigation, where applicable, gives far better results than spraying. Upon this point I have no need to refer the correspondent to his friends in either America or Australia, for there exist a number of those terribly unprogressive Natalians who have tried the two treatments and know which is the better.

The case quoted by the correspondent is a special one and with no bearing upon the usefulness of fumigation for the treating of those pests for which it is specially recommended. The two pests mentioned—Mealie Bug and Red Spider—may perhaps be more economically destroyed by other treatments than fumigation, and this will be found to be due to individual characteristics. Furthermore, fumigation is not by any means claimed as a panacea for every insect pest, and it has never been regarded as a treatment for fungus pests. If I

may express an opinion, I would say that the only fumigation which is "about dead in America" is that once commonly performed by the old gaffer with the aid of his churchwarden or black dudeen.

The farmers of Natal—see resolution of the Natal Farmers' Conference, 16th April, 1901—are in sympathy with Mr. Weaver as regards legislation for suppressing pests in orchards and keeping nurseries clean; and a proposed Bill dealing with the matter has been prepared by the writer (see Appendix A, Second Annual Report of the Government Entomologist). But why Mr. Weaver recommends such a measure and is antagonistic to precautionary measures, such as import regulations, I fail to see. He quotes California as an example, but no State has stricter regulations to control the introduction of pests than California.

I have already said that if, by the enforcement of such regulations, "Peach Yellows" can be kept out of South Africa, their existence will have been justified; and I would ask Mr. Weaver if their existence will not have been doubly justified if, through their exercise, the San Jose Scale is kept out too. Surely even he must be aware of the disastrous result of the introduction of this pest into North America and into Australia.

Mr. Weaver enquires regarding the "Fruit Fly." May I refer him to page 70 of my First and page 20 of my Second Report for fairly reliable data upon this pest, data which it is trusted will assist in any experimenting he may care to undertake. Should he care to look up further notes I would refer him to the excellent reports upon the pest by the Cape Entomologist.

Mr. E. de Wildeman, in the "Comptes Rendus," 1902, p. 400, describes a new rubber-producing plant from the Congo. *Clitandra arnoldiana* is the name of this species, and the caoutchouc is obtained by boiling the latex or milky juice with water.—"Gardeners' Chronicle," March 7th, 1903.

Horsesickness.—Suggestions.

THE following letter of enquiry (which is one of several) has been received by Mr. Watkins-Pitchford concerning his recent Interim Report on Horsesickness:—

To H. Watkins-Pitchford, Esq.,

Dear Sir,—Allow me to congratulate you on the results of your experiments as related in the *Agricultural Journal* of the 17th.

Since reading the report I have commenced to burn sulphur every night in my stable for the purpose of keeping out the mosquitoes. Your experiments, I think, conclusively show that the disease is communicated as you have for some time thought.

There are three questions I would like answers to, and as many others will be in the same position as myself, I think answers to them in the *Agricultural Journal* would be much appreciated by the public. The first is, what is the best way of keeping sufficient smoke and the best material to use in a stable? Is sulphur good, or might it injure the horses?

Second, what kind of gauze would be most suitable for windows and doors of stables? that is, what size of a mesh would you think would keep out the mosquitoes?

Third, from what time in the morning to what time in the afternoon can we safely leave horses out or have them at work, or when they must be out at night would eucalyptus oil be likely to keep off the mosquito?

Suggestions on the above would, I am sure, be welcomed by practical men.—Yours very truly,

JAMES SCOTT.

Impolweni.

22nd April, 1903.

Mr. Watkins-Pitchford replied as follows:—

With reference to the Rev. Mr. Scott's queries:—The best method of keeping stables filled with smoke is, as far as I have been able to see, by the use of horse-dung fires. Many materials have

been tried but have not proved so effective as stable manure, which the Kafir attendant should spread out to dry somewhat during the day, and collect into a heap on any piece of corrugated iron shortly before sundown. This material when lighted thoroughly will bear banking up into a fairly large heap, and in this condition will smoulder slowly for many hours without flame. Of course an arrangement of this sort should be placed sufficiently far from the manger-rack or bedding to ensure safety, but the danger of fire is negligible where even ordinary precautions are taken. The smoke which arises from stable manure is more pungent and clinging than the smoke from most other materials of which such a fire could generally be conveniently made. Whenever horses are stabled no difficulty will exist in an adequate supply of this fuel.

It is probable that in practice it may not be found necessary either to keep the fire burning throughout the entire night, or even to start it every day, and this is particularly the case where the stable has a thatched roof, for the pungent odour after a few weeks seems to impregnate the whole building to such an extent as to render it improbable that mosquitoes or other flying insects will remain within it.

No deleterious effects have been noticed in horses kept in close confinement in a smoky atmosphere for months consecutively, and as such have been closely watched in order to detect any symptoms arising from the smoke, it can be stated confidently that the stabling of horses in such an atmosphere is quite harmless even when prolonged.

The smoke need not be dense, and should be perceptible more by the nose than by the eye. It should not, of course, be dense enough to cause any symptoms of either coughing or watering from or redness of the eye.

I am fully aware that smoke has been used as a precautionary measure in some stables for years past, and I do not, of course, suggest that the principle of the

use of smoke is a recently devised one. Its use, however, has, as far as I am aware, been entirely empirical in such cases, much in the same way that Stockholm tar or Cooper's dip has been used without an understanding of the reason for the use of such agents or their effect.

If the additional precaution of placing netting over the windows and doors is adopted, such can easily be effected by tacking wire gauze on to light wooden frames which are easily removable and are as easily re-attached to their position over the window, etc., by two or three wooden buttons. These screens should be constructed of iron (or, preferably, brass or copper) gauze of about No. 32 gauge. Such a precaution is advisable in a well-constructed stable in which frames can be fitted accurately to all large openings, but unless care is also taken to ensure the early entry of all horses and the closure of stables regularly, our chief dependence must rest

upon the smoky atmosphere which penetrates every dark corner and crevice which insects, particularly mosquitoes, are known to frequent. With careful stable management and well-fitted gauze screens the smoke may be dispensed with. Horses should be stabled for at least half-an-hour before sunset during the prevalence of an epidemic, and should remain stabled until daylight is well established. This measure, if adopted as a routine precaution throughout the summer and autumn months, will do much to prevent the loss we suffer from Horse-sickness at present, and although cases of the disease will doubtless occur where horses have been exposed during the hours of darkness, or where such precautionary measures have not been adopted with thoroughness, it will be found that the exercise of care in this respect will be fully repaid by the protection which will, beyond doubt, be conferred.

Correspondence.

To the Editor Agricultural Journal.

FORESTRY IN THE TRANSVAAL.

DEAR SIR,—Under the above heading you have an article in your issue of April 3rd. You show what an enormous demand there is for timber for railway purposes alone. To this must be added the requirements for house-building, mining, fencing, bridges, etc. The necessary timber is now brought from Europe and Australia. What a slur on the farmers of South Africa! What a want of enterprise to allow this enormous trade to be solely in the hands of others. Natal is the one to whom the greatest blame attaches, for there are thousands of acres of ridgy country in this Colony useless for almost any purpose except growing timber, but admirably adapted for that. Natal landholders should not delay putting in areas of timber, but should order seeds at once for spring planting. And I would point out here that it is not much use only one man in a district planting, for his little lot will never make a

supply. Therefore let neighbours combine and each agree to put in a certain area.

There are various plantations in the Colony acting as windbreaks, shelter for stock, or for ornamental purposes. They are, however, very small in extent, but still show that big trees will grow in this Colony.

In every instance that has come under my notice, the trees planted have been the least valuable sorts for the requirements set forth in your article. Whoever advised the planting of blue gum for economic purposes knows absolutely nothing of Australian hard woods. In Australia the blue gum is only a last resort, even for fencing. I have had to do with timber for fencing, mining, house-building, etc., and have not yet seen a contract calling for blue gum. No doubt it is useful to drive away malaria, but is there any malaria in the up-country districts of Natal? Some of our Australian timbers are far and

away the best hard woods in the world, and I can say with confidence that if a judicious selection of sites be made, the majority of them will do here.

No doubt a number of farmers will decide to plant areas, especially as an extra inducement is given by Mr. Maurice Evans' generous offer. Perhaps a number of them are already wondering what sort of trees to plant, as Mr. Evans has excluded those most commonly grown. A great many mistakes are certain to be made if proper information is not sought.

Even when the kind of trees has been decided upon the question of seed crops up.

When it is remembered that single trees will be worth pounds sterling, and also taking into account the length of time they will occupy the ground, it would be the greatest folly to buy anything but the best seed. To obtain it, it should be ordered from Australia not later than June next to arrive in spring. And a few shillings extra per pound for the best seed should not be grudged.

In conclusion, I would say that if it will pay to plant areas of timber in the Transvaal, it will pay much better in Natal, because here there are large areas that cannot be profitably used otherwise.

So the farmers of Natal should hustle and get in large plantations next spring, so that they will not lose time in getting a share of the half million sterling per annum said to be necessary for Transvaal requirements. And they should also keep an eye on what Natal needs, which I expect totals up a very decent figure.

It is said that more millionaires have been made by timber in the States than by any other industry.

F. E. WEAVER.

416, West Street, Durban.

TEXAS FEVER.

SIR,—In the weekly edition *London Times* of 10th April, there is an article regarding experiments being made by the American Department of Agriculture to breed an animal immune from Texas fever.

I think the article well worth reprinting in your paper. Texas fever is much the same as redwater, and the Rhodesia fever, I understand; and if the Indian zebu oxen which have been landed are a success, the Government might make enquiries regarding cost, etc., of importing some Brahmin bull.

I notice Mr. Cordy is making enquiries about Jaagtziekte. I have lost heavily from this disease, never indeed saved a horse, but I find that grazing the horses only on old cultivated land is a preventive. Since I have done so I have not had a case.—I remain, yours truly,

JAMES GIFFORD.

Marchmont, Noodsberg,
6th May, 1903.

The following is the article referred to by Mr. Gifford:—

The systematic work that is being done at various places in the breeding or selection of plants resistant to disease has been made the basis of a suggestion by the American Department of Agriculture that something might be done also with animals in producing strains more vigorous, or more resistant to disease. Some recent experiments in Algeria, involving attempts to combat Texas fever, have an interesting bearing upon the subject. In the search for some bovine animal which was immune to Texas fever, it was found that both the buffalo and zebu were naturally resistant to this disease. The buffalo could not be crossed with domesticated cattle, but it was found that the zebu crossed readily with such, and that all hybrids thus obtained were perfectly immune to Texas fever. The female hybrids between the zebu and domesticated cattle proved to be very fertile, whilst the males were well adapted to the production of beef, or to doing work of various kinds. The hybrids grew to a weight of close upon 800 lbs. at the age of three years, and the dressed weight of the carcase averaged about 62 per cent. of the live weight. The large hump of muscle and fatty tissue situated over the shoulders of the zebu to a great extent disappears in the hybrid, whilst the bones are unusually small and delicate.

and the meat is said to be of good quality. It is asserted that the milk of the zebu or of the hybrid is richer than that of the ordinary Arabian cow, and that whilst the zebu gives from six to eight quarts per day the hybrids yield from 15 to 16 quarts. Three different races of zebras have been introduced into Algeria — from Madagascar, Cochin China, and India respectively. The third or Brahmin race is the only one which proved to be of economic importance, and is the one from which the present zebu and hybrids of Algeria have descended. The foregoing results are borne out by experience in Jamaica. Texas fever is very prevalent in that island, but it has long been known that cattle which contain a strain of zebu blood are immune to the disease. This zebu blood was introduced years ago for another purpose, but it is now proposed to import a number of zebu bulls from India for the specific purpose of securing immunity to Texas fever. These are to be used in connection with the improvement of the common cattle of Jamaica. It may be added, as a matter of interest, that some years ago a cross was effected in Ireland between a zebu bull and a Dexter cow. The product of this cross was exhibited in the Zoological Gardens, Dublin. It was a heifer in which the hump over the shoulder, characteristic of the zebu sire, had quite disappeared.

CATTLE TONIC AND NICOTINE SPRAYS.

DEAR SIR,—Could you tell me, through the medium of the *Journal*, a receipt for a cattle lick containing phosphates and iron, also could you tell me the name of the nicotine dip recommended by Mr. Fuller for cabbage aphids, and where it can be obtained?—I remain, yours truly,

W. TRELAWNEY ADAMS.

[With regard to the first question, the Principal Veterinary Surgeon states that the "lick" may be made in the following proportions:—

Common salt 24 lbs.
Phosphate of iron . . . 2 „
Mix well.

The dose for each adult beast is 2 tablespoonfuls daily. The "lick" should not be placed where the cattle can take it freely, as the results would probably be injurious.

In reply to the second question, the Government Entomologist says that any nicotine dip will be suitable, provided it is not poisonous; arsenic is fatal to plant life. He prefers not to indicate any particular make of dip.—Ed. *Agricultural Journal*.]

"NATAL CHEESE."

DEAR SIR,—May I ask you to correct a statement made in the *Agricultural Journal* of the 1st ult. The article headed "Natal Cheese" is substantially correct, with the exception that it is not Natal cheese at all, but is made at Mr. Cole's farm "Llewellyn," situated in Griqualand East, some 22 miles from the Natal border. Six separate farmers in this district are now making cheese, and a good deal of it finds its way to Maritzburg. We are only waiting the advent of the long-expected railway, either to the Ingeli or the Cape-Natal line, when we hope to find a market in your towns, not only for dairy produce, but also for our other produce, which at present it does not pay to turn out owing to the limited market up here.—Yours, etc.,

LOUIS L. GILSON.

Klip Rug, Kokstad.

Cold storage of fruit to avoid glutting markets in the flush of the season is becoming an established practice in several countries. On 1st December, 1902, there were in the United States, according to the published figures of the National Apple Shippers' Association, 4,364,800 barrels of apples in cold storage, and in Canada 470,000 barrels.

An American paper states that in the army, during the occupation of Cuba and Porto Rico, it often happened that the horses were fed molasses in addition to the other horse feed. It was found that 35lb. of grass and 13lb. to 15lb. of molasses was sufficient to maintain 1,000lb. live weight a day. It not only maintained the animal, but kept it in good working condition in a climate like that of Porto Rico.

Black Wattle Culture.

DEEP VERSUS SHALLOW SOWING.

By Messrs. HOLLEY BROS.

THE wattle industry is one which must be considered by all growers as being at the present time only in its infancy. It is, therefore, not only reasonable, but desirable, that the personal experiences of farmers who gain their livelihood by such an occupation should be freely exchanged with a view to their mutual benefit, and to the advancement of the industry.

In this connection we would like to bring to the notice of your readers the results of a system initiated by ourselves, and which we cannot but believe strikes a decisive blow at the prevailing theory of shallow-planting.

During the autumn of last year we ploughed, approximately, 270 acres of our land, and in the months of November and December this ground was gone over twice with disc harrows, and twice again with flexible harrows. Towards the end of January last we commenced planting black wattle seed in rows, with a space of 9 feet between each row and 4 feet between each seed-bed, on one half of the prepared land, and the remaining half in the same manner, but with 6 feet intervals. Hoes were used for the planting. Having reason to question the theory of placing the seed as near the surface as possible, as advocated by many growers, we put in our seed at a depth of from 3 to 5 inches. In each hole we used one or two dozen seeds, these having been boiled, in many cases for six minutes the night before, in others two or three days before, while in some instances the seed was used almost immediately after scalding. Care was always taken, in covering in, to use loose broken soil. This was then trampled firm, every precaution being taken to see that all weeds and grass were removed from the vicinity of the seed-bed. After planting little more than half the ground, owing to the drought, we considered it advisable to cease planting until rain fell, which

eventually took place three weeks or a month afterwards. We fully expected, under the circumstances, that the ground we had planted in the excessively dry weather would have to be re-planted. To our surprise, however, we find that all the seed has come up equally well everywhere. We have traced the rows in many parts of the ground, and in no instance have we discovered that the seed has failed to come up in more than two or three consecutive seed-beds.

It would, therefore, appear that the theory of shallow-planting is open to criticism. We are in every way satisfied with our system, the only drawback being that the plant does not appear until three or four days later than under the shallow-planting system, which is, after all, but a trifling objection when taking into consideration the fact that the trees do not attain their full growth for some years. On the other hand we are of the opinion that the shallow planting system is a dangerous practice, as it lays the seed open to the action of drought, which is avoided by the above method of comparatively deep planting.

We would point out, in conclusion, that the position of the ground referred to above is not exceptionally favourable to wattle culture in its early stages, the aspect being a north one, and subject to the full force of the sun and north winds, the altitude being on the average 2,700 feet.

The renovation of unmarketable eggs in London is a curious process, and one much calculated to deceive the eye. When eggs have remained so long unsold that they have become too dirty to command respect and tempt purchasers, the vendors have a method of applying a composition of diluted vitriol to the shell, which almost in an instant removes all impurity and gives the egg the appearance of one that has just been laid. It will be needless to add that this "renovation" process penetrates no further than the shell.

Government Meteorological Returns.*Meteorological Observations taken at Government Stations for Month of April, 1903.*

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).						
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days	Heaviest rainfall in one day.		Total for Year from July 1st, 1902	Total for same per- iod from Ju- ly 1st, 1901.	
	Maximum.	Minimum					Fall.	Day.			
Observatory	78.7	62.8	86.2	55.8	5.97	18	3.78	28th	32.99	40.71	
Stanger... ..	78.8	59.5	90.0	53.0	3.31	21	1.10	2nd	32.90	39.10	
Verulam	82.8	62.6	95.0	53.0	6.59	13	4.06	27th	31.62	39.49	
Greytown	80.7	50.1	84.0	46.0	3.77	16	.81	15th	...	41.93	
Newcastle	74.2	49.0	87	40	4.61	13	1.48	27th	21.32	32.15	
Estcourt	75.3	50.5	89	39	3.88	10	1.70	28th	24.10	29.46	
Port Shepstone	78.8	53.2	85	43	13.48	13	5.75	27th	...	46.24	
Umsinto	79.0	61.7	93	52	4.80	10	1.92	27th	37.43	35.78	
Richmond	73.3	52.3	89	42	7.05	17	1.95	27th	30.67	37.60	
Maritzburg	77.1	54.0	92	44	4.06	13	1.45	27th	24.55	30.63	
Howick... ..	75.5	50.4	87	42	2.35	13	.71	29th	18.78	29.50	
Dundee... ..	77.8	54.7	84	47	6.60	10	1.50	9th	24.52	...	
Weenen	81.3	51.6	93	42	3.77	10	1.07	28th	23.41	27.04	
New Hanover	75.1	52.8	92	42	5.90	16	1.93	12th	26.14	36.11	
Mapumulo	81.6	53.2	96	43	3.22	8	1.50	2nd	28.28	...	
Nongoma	75.4	59.5	89	52	8.61	9	1.90	12th	...	38.53	
N'Kandhla	68.3	41.6	80	35	5.80	10	1.50	13th	...	...
Qudeni	64.9	46.0	75	38	6.02	22	1.05	2nd & 29th	40.77	56.77	
Hlabisa	73.9	55.6	85	46	3.50	7	3.70	13th	...	39.75	
Melmoth	75.7	56.2	94	50	4.33	11	1.14	13th	23.67	29.69	
Nqutu	70.3	35.4	84	28	3.24	10	.89	12th	21.56	...	
Eshowe... ..	...	...	...	...	...	...	...	...	...	49.75
Point ... ..	...	...	...	...	4.84	12	2.60	27th	...	31.36
Ndwedwe	76.3	54.6	93	40	5.67	14	1.11	28th	...	...
Hilton Road	72.5	50.4	87	43	2.35	16	.64	28th	...	...
Paulpietersburg	72.3	...	86	...	6.14	12	2.27	28th	...	...
Mahlabatini	74.8	55.7	84	47	...	...	...	...	...	...
Idhebe	78.4	58.4	88	49	8.13	8	1.86	28th	...	...
Lower Tugela... ..	...	...	97	53	2.89	13	.80	3rd	26.40	...
S. C. Junction ... ..	...	...	...	...	7.10	14	4.30	28th	29.70	45.26
Underberg ... ..	...	...	...	...	3.10	9	.96	28th	...	...

OTHER STATIONS.

Estcourt (James Lewis)	86	37	4.43	13	1.19	28th	25.12	30.18
Nottingham Road (C. J. King) ... ..	...	...	5.98	14	2.23	12th	34.15	...
Adamshurst (Wm. Adams)	90	46	2.77	15	.88	27th	20.48	...
Hilton (Archibald Pearce)	88	45	3.22	12	.82	27th	23.96	36.67
P.M.B., Town Bush Valley (Wilkinson's Nursery) ... ..	...	...	6.54	13	1.81	12th	...	...
Ixopo, Gorton (Chas. Green) ... ..	...	...	3.27	10	1.51	28th	...	20.64
Mid Illovo, Imont (A. N. Montgomery)	81	46	6.06	16	2.23	28th	...	41.29
Ottawa (G. Wilkinson) ... ..	...	...	5.13	8	2.85	28th	29.25	43.12
Mount Edgecombe (Natal Estates)	90	55	5.43	11	3.23	28th	32.18	53.21
Cornubia ... ..	...	...	5.48	...	...	...	34.28	53.87
Milkwood Kraal ... ..	...	...	5.46	...	...	...	25.65	39.72
Blackburn ... ..	...	...	4.56	...	...	...	29.78	46.26
Saccharine ... ..	...	...	6.05	...	...	...	32.20	49.63
Prospect Hall ... ..	...	...	5.73	...	...	...	28.80	30.03
Olairmont (J. R. Blamey) ... ..	...	...	6.84	10	3.18	28th	...	47.15
Esquefa (W. Hawkworth)	90	53	5.78	13	2.41	28th	33.01	40.16
Umsinto, Beneva (E. W. Hawkworth) ... ..	...	...	6.28	12	2.32	27th	33.28	45.65
Central Experimental Farm (Manager)	80	45	2.35	16	.62	27th	...	...

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ... W. de Bathe ... N. Grant ... J. Ralfe ...	Snelster. Otterbush. Branfontein Frere
J. Button .	Estcourt, South of Bushman's River	"	D. W. Mackay ... E. Downing ... W. A. Bartholomew J. Mattison ...	Dalton. Sheldale Vale Friar Tuck Klipstone
J. J. Hodson ...	Lion's River ...	"	D. C. McKenzie ... W. Henderson ...	Lion's Bush Hilton
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Baynes .. J. A. Vanderplank	Meyer's Hoek Ntimbankulu
A. Hair ...	Pietermaritzburg City and Umgeni	"	A. Otto & Son ...	Otto's Bluff
K. Soutar ...	Portion of Lion's River	"	C. J. Smythe ... J. Chadwick ... K. Soutar ...	Stratherne Howard Stey Braes
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe.
W. Wilson ...	Polela ...	"	J. Isbister ... J. D. Watson ... H. Nicholson ... H. Brown ... J. Stone ... J. Comrie ...	Buckquoy. Rainbow X.L. Farm Prosperity Gowrie Hepburn
J. Trenor ...	Alfred ...	"	Mongola, Guveel, Qupasa, and Ntokolo W. Niemack ... Tolwayo & Nvuna	Location. Macton Location
A. H. Ball ...	Weenen ...	"	A. D. J. Taylor ...	Beaconsfield
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	F. Zuckel ...	Beaulieu
R. J. Raw ...	Impendhle ...	"	C. P. Speirs ... F. G. Palmer ...	Mount Park. Heron Vale
R. Vause ...	Ixopo ...	Lungsickness	A. Watson ... Nkulka ...	Forest Hill English M.S., High-flats
C. Swales ...	Umlazi ...	"	Cold Storage and Supply Co. ... Native, Sam Pawkes	Richmond Farm, near Pinetown Assegai Kraal, near Betha's Hill

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 48 herds of cattle under license for Lung sickness, and 28 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	...	2 for Lung sickness,	— for Scab
Klip River	...	...	...	...	9	10
Dundee	...	...	...	...	2	3
Umsinga	...	...	...	...	5	2
Upper Tugela (North of Tugela River) Division	...	...	...	...	—	2
Utrecht District	...	...	...	...	1	1
Vryheid	...	...	...	...	6	5
Paulpietersburg	...	...	...	...	2	—
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	...	...	2 for Lung sickness	2 for Scab.
Nkandhla and Nqutu Districts...	...	...	...	...	10	3
North of White Umfolosi and Umfolosi Rivers	...	...	...	...	9	—
Total	...	...	...	...	48	28

Rinderpest exists at undermentioned places:—

Krantzkop Division.—Amobonvu Location and Gayedi Location.

Estcourt Division.—Bursea.

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District, Vryheid District, and Paulpietersburg District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 10th June, 1903.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of May, 1903:—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised.	
	Above Ground.			Below Ground.			E.	N.	I.	tons.	cwt.
Natal Navigation	20	54	145	16	282	82	7	14	2	10,800	4
Elands Laagte	10	15	145	11	150	250	4	38	16	8,882	12
Dundee Coal...	10	14	170	14	117	304	2	24	32	7,095	...
St. George's ...	11	94	87	8	200	97	1	9	0	6,069	...
Glencoe	17	122	87	10	278	9	2	3	...	4,179	16
Natal Steam Coal	1	24	4	2	130	4	...	...	...	2,759	5
Natal Marine	6	55	7	5	102	4	...	...	...	2,618	12
Newcastle	3	10	11	4	88	3	...	...	...	1,502	13
No. 42	6	14	17	2	75	...	...	...	...	1,411	10
Bamsay	3	14	14	3	20	28	2	21	12	1,260	3
Natal Merthyr	5	20	4	2	130	6	1	10	...	1,082	0
W. Lennoxton	3	4	12	2	20	24	1	4	4	1,000	0
Crown	2	12	34	2	46	8	...	...	...	817	0
South African	7	62	6	2	86	1	5	143	...	808	0
Central	2	30	2	2	99	...	4	13	...	781	2
Natal Victoria Navigation	1	19	1	1	41	0	2	8	2	538	9
New Campbell	2*	2	4	1	5	3	...	8	7	121	0
Hlobane	...	2	...	1	4	...	...	...	...	96	0
Vrede	1	6	...	...	...	...	...	...	...	27	0
Total ...	110	573	750	88	1,873	823	31	295	75	51,849	6
Corresponding month, '02	114	464	672	84	1,458	1,254	16	65	127	56,526	18

*Employed also on unproductive work.

9th June, 1903.

CHAS. J. GRAY,

Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of May, 1903:—

Bunker Coal	...	...	...	...	...	tons.	cwt.
Exported to:—						20,813	9
Cape Colony	...	...	...	...	...	50	15
Beira	...	...	...	...	...	21	15
Total ...	...	...	...	...	...	20,885	19

Custom House, Port Natal,
3rd June, 1903.

(Signed) GEO. MAYSTON,
Collector of Customs.

Weekly Rinderpest Report.

UP TO 9TH JUNE, 1903.

Krantzkop Division.

Gayedi's Location.—No deaths; 2 sick.

Estcourt Division.

Burseca.—No deaths; no fresh cases. Number of deaths to date from 26th May, 5.

Zululand.

Eshowe District.—11 dead; 17 sick. Number of deaths from 26th May to date 31.

Umlalazi District.—5 dead; 9 sick. Number of deaths from 26th May to date, 13.

Lower Umfolozi District.—No deaths; no fresh cases. Number of deaths from 26th May to date, 11.

Nkandhla District.—17 dead; 20 sick. Number of deaths from 26th May to date, 31.

Mahlabatini District.—3 dead; 12 sick. Number of deaths from 26th May to date, 10.

Ndwandwe District.—No cases reported. Number of deaths from 26th May to date, 7.

Paulpietersburg District.

No deaths; no fresh cases.

Vryheid District.

No deaths; no fresh cases. Number of deaths from 26th May to date, 19.

S. B. WOOLLATT,

P.V. Surgeon.

5th June, 1903.

District Reports.

NEWCASTLE, 9th May.—I do not know whether the vagaries of the weather are any longer a topic of general interest, but the record of many, many years has been fairly eclipsed by the amount of "latter rain" which has fallen, the "former rain" having been unfortunately omitted. During April the rainfall here has registered 4.61 inches, but by far the greater portion fell on the 27th and 28th, followed by heavy showers on the 1st and 5th May. Late crops, water springs, and veld should benefit largely, as otherwise there was a dread certainty of an absence of grass and water during the winter. The warm weather now prevailing has kept back frosts, which have visited only the very high veld. In spite of the dry season, those under the Berg will reap sufficient grain for their own use, with perhaps a little to sell, and I am glad to see some good forage grown, without any rust. Even though some parts of the District will be mostly dependent on imported grain, I see no reason to anticipate any necessity for public relief, as local storekeepers should be able to sell at prices within the reach of all. The Natives will only have to put in a few extra months of labour. Up to the present they have paid more than the half of their taxes, with the usual alacrity, and in the course of another week will have paid all. A very large number have to take back overplus money, a healthy sign, I take it. Business at the country stores also is fairly brisk,

another good sign. I regret to hear of outbreaks of glanders in horses and lungsickness in cattle in the Normandien part of the district, but the Veterinary Department is meeting them with its usual energy. With those exceptions stock is healthy, and looking well, but farmers should beware of carelessness in not reporting outbreaks of any sort, or I should say any individual outbreaks amongst animals, which animals are, without doubt, the mainstay of his calling. A word to the wise should suffice.

J. O. JACKSON, Magistrate.

IXOPO, 9th May.—Good rains have fallen recently, and if the frosts keep off the late mealies will be a fairly good crop. Most of the Natives living south of the Umkomaas-Umzimkulu main road will have sufficient food for their own consumption, but those living north of the said road will require to buy foodstuffs. The Natives are paying up their hut tax well, there being scarcely a defaulter, and there should not be considering how easily money is obtained if they are only willing to work for a month or two, or sell a few fowls.

FRANK E. FOXON, Magistrate.

LOWER UMFOLOZI DISTRICT, 2nd June.—Rain only fell on five occasions during the past month; the 1st being a drizzly day; a severe thunderstorm from the south-west being experienced the night of the 8th; the night of the

9th a slight rainfall occurring; a steady and heavy downpour, with rather cold wind from the south-west prevailing all day on the 15th; and on the 27th a slight shower fell between 1 and 2 p.m. Nice, though small, crops of green mealies and sweet potatoes exist throughout many parts of the District; which have been saved and brought on by recent late rains. The mortality through rinderpest among stock would appear to be decreasing, as only twenty deaths were reported, as against 72 inoculated. Inoculator Graham resigned, and Native Inoculator Oele was discharged as from the 1st ultimo. On the 20th a large swarm of locusts was seen flying from the N.W. to S.E. in Chief Sokwetshata's Location, i.e., from the vicinity of the Mengu Hill towards the Chief's Kafuleni kraal.

A. R. R. TURNBULL, Magistrate.

EMPANDILENI, 30th April.—The Natives are just beginning to reap what small crops there are, but grain is very scarce, and the local storekeepers have but little on hand; nearly all have expressed their intention though of getting in supplies of mealies to meet the demands. The present price of mealies is 40s. per muid, and taking into consideration the price of mealies in Natal, this cannot be considered out of the way. The destruction of the hopper locusts was brought to an end on the 7th instant, when they began to fly. No damage has been brought to my notice as having been done by this pest. There were no outbreaks of lung-sickness, and the District is now free from the disease. Rinderpest, I am pleased to say, is almost stamped out, with the exception of a few kraals in the Ward of the Chief Ndube the District is clean. Mr. C. Tyler, D.V.S., Zululand, and Mr. J. R. Cooper, Stock Inspector, visited the Magistracy at the beginning of the month. There have been no deaths reported from horsesickness. The Chief Matshana Ka Mondisa was reported as being very ill, but I am glad to say is better again. The health of the District on the whole has been good. The escaped convict, Manzoli, who was undergoing sentence of two years' for sheep stealing, was recaptured by the Police at Dundee; this has had a very good effect upon the Natives.

C. C. FOXON, Magistrate.

EMPANDILENI, 31st May. — The weather has been very pleasant throughout the month. There was a heavy fall of snow all along the Qudeni Range to the Madhlozi Hill on the 15th instant. The total rainfall for the

month was 1.25 inches. Mean temperature was 84 degrees, and the minimum temperature was 31 degrees. The Natives have been busy reaping what small crops there are. All the local storekeepers have promised to bring in sufficient mealies to supply the demands at reasonable prices, about 40s. per muid. No locusts have been reported. The District is now free from lung-sickness. I regret to say a fresh outbreak of rinderpest occurred in the Ward of the Chief Sitshitshuli. These cattle had been inoculated about three months ago. The disease also still exists in the Wards of Ndube and Siganda. Mr. T. W. Cooper, Inoculator, informs me that some 50 head of cattle have died during the month. The health of the district has been good.

C. C. FOXON, Magistrate.

LOWER UMPOLLOZI, 5th May.—The weather during the past month was much cooler than usual. Rain fell on nine out of the thirty days, heavy downpours occurring on the 1st, 2nd, 26th, 27th, and 28th. One hundred and twenty-six head of cattle were reported dead from rinderpest, and one at Native Kobeyana's Kraal, in Chief Sokwetshata's Location, from mume fever. Only six cattle were reported inoculated by Native Inoculator Oele; and Native Inoculator Reuben was discharged by the Stock Inspector, owing to his unwillingness to go further afield in the District than three to five miles from the Magistracy, lest he should fall a victim to fever. Sweet potatoes were the only food product planted by Natives, and should do well, owing to the recent abundant rainfall, which it is understood has partly saved the stunted mealie crops in many places, besides groundnuts, native potatoes, amadumbe, and other petty vegetable products generally grown in small quantities by Natives. The railway was opened 18 miles further north to Kwa Mbonambi Road Station.

A. R. R. TURNBULL, Magistrate.

MAHLABATINI, 1st May. — The weather has been pleasant, with now and again a sharp reminder that winter is upon us. The first fortnight of the month was dry, but during the third week considerably over an inch of rain must have fallen. At Idhlebe, about 16 miles from here, the rainfall was 4.06 up to the 23rd. On the 27th and 28th heavy rains fell—quite 4 inches. Stock of all description is looking well, and I am glad to say that the District is now free from rinderpest, no fresh outbreak having occurred for over a month. One case of lung-sickness was

reported, and the herd was promptly inoculated by the local inoculator, Mr. Chapman. As instancing the danger of keeping cattle that have recovered from lung sickness, it may be mentioned that this herd was infected by an old "lunger," the disease having again become sufficiently active in the beast to infect the others. It does not seem a nice idea, from a consumer's point of view, but a lunger should be sent to the butcher as soon as he is fat enough to kill, or the danger of infection will always be present. Mr. Power, of the Veterinary Department, has broken up his camp at the Bek-anuizi, where he was for some months carrying on experiments in regard to horsickness. The result has proved pretty conclusively that the mosquito, and the mosquito alone, is the cause of infecting horses with the dread disease, and that the dew, except in so far as helping to breed the mosquito, has little or nothing to do with horsickness. The mealie and mabele crops have been total failures, and mealies are selling at from £2 to £2 5s. per muid. The demand at present is not very great, but in another two months it will tax the resources of the storekeepers and traders to keep up the supply.

A. J. MARITZ, Magistrate.

HOWICK, June 9th.—The month of May has been a typical winter month, and frosts have been of frequent occurrence since the 15th, on which date there was a fall of snow in certain parts of the division. Only two insignificant showers of rain have fallen. The maximum temperature during the above period was 84 degrees, registered on the 9th ultimo. The weather has been extremely pleasant in spite of the sharp frosts, and the north winds which were so prevalent at this season last year have been totally absent. Crops are now being harvested, and are turning out far below the average for the past ten years. Many of the later mealie crops were nipped by the early frosts, which, following upon a season of prolonged drought, played havoc in most parts of the district. The amount of hay which has been cut in the division is only equal to about two-thirds of last year's crop, but it is hoped that the higher prices will recoup the farmers for the deficiency in quantity. Stock throughout the district is in good health, and in comparatively good condition for this time of year. A case of considerable interest to farmers came before this Court on 30th ultimo, in which a local farmer was prosecuted under Section 12 of the Scab Law, No.

48, 1887, for driving a flock of sheep infected with scab along the main road from his farm to the stock fair, which said flock of sheep were not observed by the purchaser as suffering from scab until about a month after he had bought them at the fair. The defence was that on the day of sale the owner picked out a certain number of wethers and sent them to the stock fair, not knowing that any of his sheep were so infected, until he examined them carefully the day after the sale. As Section 11 of the Law provides that if "one sheep in a flock is proved to be infected with the disease called scab, all the sheep in such flock shall be taken and deemed to be so infected," I had to convict the seller though he was ignorant he was selling infected sheep; also, though there was nothing to indicate on the day of sale that the sheep sold were suffering from the disease. The important point (as the law now stands) is for owners of sheep to be certain that none of their sheep are suffering from scab before they remove them from their farms for sale or any other purpose, as they are liable to a fine of from £5 to £50 for such an offence, and the best plan would be for the owner to have his flock inspected by the Stock Inspector before he removes any sheep from his flock. As Returning Officer for the electoral district of Lion's River Division, which comprises the Magisterial Divisions of New Hanover, Impendhle, and Lion's River, I would take this opportunity of reminding all persons in said district, who claim a vote under the Lodgers' Franchise, to communicate with the Fieldcornet of his ward, as this is the only month in which lodgers can have their names registered, and it matters not whether their names have appeared on the Voters' Roll before, as certain information has to be supplied each year in June by the voter, and request his name to be placed on the Voters' Roll.

J. W. CROSS,
Magistrate, Lion's River.

An interesting analysis of molascuit, made from vacuum pan molasses, by Professor John Hunter, F.I.C., F.C.S., appears in a recent issue of the "West India Committee's Circular." The analysis is regarded as highly satisfactory, and affords testimony to the qualities of this product as a cattle food. Professor Hunter states:—"This is an excellent example of feeding stuffs of its class. If judiciously used it will be found a highly advantageous addition to the ordinary feeding stuffs of the farm."

Market Reports.

Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—Notwithstanding the fact that we are now within a few days of what is commonly known in the City as Show Week, it is with regret that we have to chronicle a statement which is far from pleasant, viz., that trade is far from brisk, and it is a question if it has been worse for some years past. Of course, this was predicted months back, when it became positively known that the crops were doomed to be a failure in many districts. We hear that a few mealies will come in from unexpected quarters, but as very few natives will have any grain, or anything else to bring to market, it is a blessing to be able to state that mealies are now coming forward from America, India, and the Argentine at prices to prevent any serious consequences. The action of the Government in reducing the duty on imported grain from 4s. to 2s. per 100lb. will be a great advantage to the consumer. We are informed that the new tariff will come into operation on the 1st of next month, but it is a question if it will meet with the approval of that section of the producers who were hoping to realise prices that would in a measure recoup them for shortage.

Mealies.—Natal mealies are realising from 20s. to 21s. per muid; imported grain varies from 18s. to 21s. per muid.
Forage.—From 9s. 9d. to 10s. 9d. per 100lb.

Hay.—A large quantity of hay has found its way to market, in fact, far more than many at one time thought it could be possible. Prices have fluctuated between 1s. 3d. and 4s. per 100lb.; bedding, from 7s. to 30s., according to size of loads.

Green Barley.—From 1s. 3d. to 1s. 6d. per lot.

Potatoes.—Prices are very reasonable, and good varieties have been as low as 0s. 6d., 7s., and 8s. 9d.; better samples realising from 11s. to 15s. 9d. per 100lb; sweet potatoes, from 3s. 3d. to 8s. 6d. per sack.

Onions.—From 10s. to 25s. 9d. per 100lb. Large quantities are on the water, and one may presume that prices will remain as quoted.

Pumpkins.—From 3s. to 7s. 3d. per doz.

Kafir Corn and Buckwheat.—Notwithstanding the demand privately, very little offering on market.

Poultry.—Common fowls, from 1s. 7d. to 6s. 9d. each; ducks, from 3s. to 10s. each; guinea fowls, from 8s. to 9s. 3d. per brace; turkeys (cocks), 9s. to 16s. 6d. each; turkeys (hens), 6s. 9d. to 7s. each. The recent exhibition of poultry, held under the auspices of the Pietermaritzburg Poultry Club, has demonstrated beyond all doubt that some of the best breeds can be raised to perfection, not only in the immediate vicinity of our City, but throughout the entire colony.

Butter.—Fresh, from 1s. to 3s. per lb.; salt, from 9d. to 1s. per lb.

Eggs.—From 1s. 9d. to 4s. 6d. per doz.

Sundries.—Beef, 3d. to 10½d. per lb.; pork, 4½d. to 10d. per lb.; mutton, 6½d. to 1s. 2d. per lb.; lamb, 9d. per lb.; trussed fowls, 1s. 9d. to 2s. 9d. each; pigeons, 6d. to 1s. 10d. per brace; rabbits, 1s. 3d. to 1s. 9d. each; partridges, 1s. 6d. to 3s. 3d. per brace; hares, 3s. to 4s. 6d. each; venison, 8d. to 1s. 4½d. per lb.; bacon, 8d. per lb.; and sucking pigs.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, celery, eschalots, lettuce, onions, pears (Avocado), peas, radishes, rhubarb, spinach, tomatoes, and turnips.

Fruit.—Apples, bananas, guavas, lemons, limes, naartjes, oranges, papaws, and pineapples.

Firewood.—From 5d. to 9½d. per 100 lb.; cut firewood, 11d. to 1s. per 100lb.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is very bad indeed just now, and with the tightness of money and discouraging outlook, things are decidedly "blue."

Mealies.—Importation rules the situation. The colonial crop is so bad, and supplies so erratic, that quotations are only nominal. Good grain of any sort fetches about 18s. per muid, but a drop may be looked for after 1st July.

Potatoes.—The market has been badly glutted lately, and prices fell to nothing. The last week, however, has witnessed an improvement owing to the fact that growers have withheld supplies. Any really good samples fetch 18s., but farmers would do well to send in small lots daily, and thus obtain a high average on the season.

Hay, Forage, etc.—In fair supply at late rates.

ESTCOURT.—Mr. James Lewis, Estcourt, when recently sending a local market report, writes:—

The new kraals are a great improvement on the old style of selling in the open; also great convenience to buyers and sellers. The cattle first come into a sorting kraal, are then taken down a passage to the selling kraal, from there they go into a receiving kraal, where they may remain in perfect safety, providing the gates are kept shut. The sheep enter on the opposite side direct from the pens. Mr. Joseph Henwood, the contractor, is to be congratulated for his work, and in making a good and successful job.

JOHANNESBURG.—Mr. W. Thomas, Box 1960, writes:—There is not much change in the market since my last report, with the exception of our imported produce, viz., South American bran, Alfafa, and North and South American maize. The prices are very high of town stocks, owing to the local merchants not importing, and just keeping going from hand to mouth until the cheaper railway rates come into force next month. The chief mealies at present in town are from Mozambique and Inhambane, owing to the cheap rates from Delagoa Bay. Local stocks are sold at from 26s. to 28s. 6d. per bag 198lbs., or 90 kilos. Local mealies are coming in now, and are being readily bought on the market at 28s. to 29s. per bag of 203lbs. Mabele is very scarce; about 15 bags offered realised 43s. 6d. per 203lbs. This was last season's stock, being weavily and old looking as well. The ruling prices for the week are:—

Barley, for Seed, per 163lbs. Bags.—Only a few bags were offered this week, of indifferent quality, realising 19s. to 21s. 6d. per bag.

Green Barley, for Forage, per 100 Bundles.—Large quantities are being sent to the market now, but prices remain very firm, from 20s. to 35s. per 100 bundles. Some very good stuff is being offered.

Bedding, Dry Grass, per Load.—Every morning the market place is crowded with all manner of vehicles loaded with dry grass, which always realises very well, from 10s. to 50s. per load, according to the size of the vehicle.

Bran, per 100lbs. Bags.—No colonial or South African stocks are offered, so South Americans takes the place. Only a few bags are placed on at a time, and realise from 11s. to 11s. 9d. per bag.

Bales of Chaff.—This line has been realising very well lately, and in fact

much better than oathay, considering that there is hardly anything else but straw. This realised from 8s. 6d. to 10s. 3d. per 100lbs.

Kafir Corn, per 203lbs.—This is very scarce. A few bags offered this week realised as much as 43s. 6d. per bag. Some Bombay corn was offered for sale at 33s. per bag, but was withdrawn, 35s. being required.

Manna Hay, per 100lbs. Some very indifferent quality was offered, and realised 6s. to 8s. per 100lbs.

Mealies, per 203lbs. Some South American mealies were offered of very indifferent quality, and realised 26s. 9d. to 27s., whilst some Mozambique and Inhambane were sold at 26s. and 26s. 6d. Local new mealies fetch from 28s. to 29s.

Oats, per 133lbs. — Mostly military oats being sold, in pockets of 75lbs. to 80lbs., realising 7s. 6d. to 8s. per pocket. Seed oats are scarce, and realise from 18s. 3d. to 20s. 9d. per 133lbs.

Oathay, per 100lbs., in Bales. — The market continues to be very well supplied with this line, and prices remain very low. Some very good stuff realised 11s. 6d., whilst towards the end of the week only 10s. 6d. could be obtained, the prices being from 8s. 6d. to 11s. 6d. for the week.

Onions, per 125lbs. — The market is really overstocked with this line. Every merchant's store is crowded with this produce. The market seemed firmer towards the end of the week. Large quantities of Australian onions are in the town. Prices for the week being from 14s. to 20s. per 125lbs. bags.

Potatoes, per 163lbs. — Although large quantities continue coming on the market daily, prices remain pretty firm, every day about 2,000 bags being disposed of. The prices for local new early rose being 25s. to 30s.; imported from Cape Colony, Natal, and surrounding district, 20s. to 24s.; medium potatoes, 14s. to 17s. 6d.

Eggs, per doz. — Local fresh, 3s. 6d. to 5s. per doz.; colonial imported, 2s. to 3s.; oversea imported, 1s. to 1s. 6d.

Poultry. — Ducks, 6s. to 8s. each; fowls, 2s. to 4s. 6d. each; geese, 7s. 6d. to 10s. each; turkeys (hens), 7s. to 8s. each; turkeys (cocks), 12s. to 17s. each.

Tobacco.—Cut, per lb., 6d. to 1s.; leaf, 6d. to 1s. 6d.

Firewood, per 100lbs.—1s. 3d. to 1s. 9d.

Live Stock.—Oxen (slaughter), £18 to £22 10s.; oxen (trek), £16 to £18; cows, £14 to £17; mules, £10 to £15; horses, £12 to £20; donkeys, £6 to £10; wethers, £1 to £1 10s.; goats, 17s. 6d. to £1 5s.

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The Amabele Aphis.

By CLAUDE FULLER, Government Entomologist.

THE following notes upon this new pest of Kafir Corns, or Amabele as they are locally known, are more or less of an emergent nature, and written with a view to placing the observations made up to the present moment before growers of this crop. My chief object is to give some answer to those who suffered severely from the pest, and who, naturally enough, have asked whether they should plant again next season. Such a question is not easily answered. Indeed it is one to which, in discretion, a

deaf ear should be turned, and this for excellent reasons. First, because we are dealing with what is quite a new pest, whose true life cycle and habits are practically unknown; and secondly, because, whilst the attack is new to us in Natal, there are quite a number of parallel instances in other parts of the world of such sudden and apparently spontaneous attacks of aphides upon grain and other crops, and the study of these particular cases has not yet led to any certain knowledge of their cause. It may be em-

platically said that the exact reason for such outbreaks is not by any means correctly ascertained, and, therefore, no reply can be given with any degree of certainty. To the practical mind of the farmer such a statement demands an explanation. For what does he pay taxes and contribute towards the maintenance of an expert—as he terms an entomologist—if an answer to such a question is not forthcoming? May I, in apology, reply that the science of the economy of insects is yet so young that many enigmas such as this remain unsolved, but, in extenuation add that, as time goes on, and more and more instances are studied and their many intricacies unravelled, knowledge of the exact causes underlying them will be ascertained, and outbreaks such as this satisfactorily explained. However, to essay an answer to this important question, whether crops should be planted in the districts where they were devastated by the aphid last season: my reply is that crops cannot be planted without a certain amount of risk, but that growers will be justified in taking that amount of risk, because it would appear that the aggressiveness of the pest has been in proportion to the season's favourableness towards it, and there is no reason to expect the same climatic conditions to immediately recur. I would, however, add that in order to lessen the attendant risk no effort should be spared to get the crop in early, to suitably manure it, and to thoroughly cultivate it.

To show my reasons for this reply it is necessary to give some account of the outbreak and the climatic circumstances attending it, and also to review some features of aphid attack. The season was abnormal: it favoured the increase of the aphid and militated against the vigour of the plant. Plants wanting in vigour suffer and even succumb to aphid attack where vigorous plants survive, and last season the crops shown to have suffered the most were those late planted and badly cultivated.

The first intimation of the occurrence of the pest to reach me was from Chaka's kraal, this was on the 25th of January. Further reports rapidly followed from

Zululand, and upon 10th February I visited the Stanger District and particularly investigated Mr. Essery's 120 acre cultivation of mabele.

On 19th February I wrote to the various District Locust Officers then at work along the Coast, and from their reports the insect had extended to the south of Alexandra County. Locust Officer D. Bakie was the first to reply from Lower Illovo, having noticed the pest about 23rd February in patches, after which it rapidly increased throughout the District, and from the information at my disposal it would seem that the aphid made its first onslaught in the coastal region of Zululand, over which territory, from information supplied me, it spread with the exception of Ngutu. During February I found it in the heart of Maritzburg, on a few plants growing in the neighbourhood of Chancery Lane, and fenced in all round by high buildings.

On 25th February Mr. H. Light reported the pest from Dalton District, and about 15th March I heard of it from Richmond. Subsequently, 5th April, I found it on a few volunteer plants growing in Mr. Forder's garden, Bulwer, and Mr. Marriot reported the insect at Dronk Vlei (March 30th).

Judging from observations, I feel certain that the pest first assumed aggressive proportions in Zululand and about the Lower Tugela, and thence spread southward along the Coast and inland, and I believe that had the conditions there been less favourable than they were the pest would not have become so abundant throughout the coastal and eastern regions of the Colony.

The feasibility of this is explained by the procreation of the insect, and the favourable conditions which will be discussed in detail later. With regard to the productiveness of the particular aphid under observation, I am unable to furnish exact data, but from casual observations I believe it to be very great, and conceive it being greater than that of many species. As compared with other insects and many lowly organised animals, the actual number of young produced by one aphid is comparatively small, but this is more than balanced by their pre-

cocity. During summer months they begin breeding when from seven to ten days of age, and bring forth their young alive. Many observations confirm this fact, and many calculations have been made to ascertain what their progeny would amount to in a given time, if not controlled by any untoward event or antagonistic agent. My own calculations, which follow, are based upon the black aphid of the peach, and are sufficiently astounding without entering into those made by others. These showed that the insect commenced to bring forth young upon the seventh day of its life, and continued to bear young for nineteen successive days, in all 109. It was born itself on 25th September (1901), bore its first children on 1st October and its last on 20th October, dying upon 29th October. The rate of reproduction varied from two to eleven. For the sake of convenience in calculating this was regarded as a mean of five per diem for the twenty days, and on this basis the aphid born on 25th September was upon the day of its death the progenitor of 83,226; 100 being children, 3,825 grandchildren, 35,750 great grandchildren, and 43,550 great great grandchildren (note, these figures are, if anything, below the mark, owing to the mean five being adopted instead of the actual figures). It is not possible to give any popular standard of comparison owing to the varying sizes in which the insects would be, but assuming that one hundred are grouped together so as to cover one square inch, then the page upon which this matter is printed would carry the total, less 10,000, or at any rate sufficient to destroy three large mabele leaves.

A further calculation, which has been worked out by a mathematical friend of mine, is that at the end of sixty days a single aphid will have living over 3,000,000,000 descendants, in fact sufficient, at the reasonable estimate of 100 per square inch, to cover 5 acres of land.

Bearing such figures in mind (as far as conceivable) it is not difficult to explain the rapid spread of such a pest. It can at once be seen that if such insects went on breeding unchecked, there

would be room for nothing else in the world. There exist, however, many checks, and it is their absence or suppression which permits of an aggressive increment such as was witnessed last season, and was followed by the destruction of the amabele crops.

Actually what constitutes the whole army of checks cannot at present be said. It is natural, however, that such delicate insects should rapidly succumb to antagonistic influences. Observations go to show that cold is no drawback to them, but excessive heat is.* Naturally, they are found rather in the temperate than in the torrid zones, and this may in a measure account for the fact. Aphides which feed upon exposed portions of plants—as farmers know generally—are considerably affected by a sudden down-pour of rain, and it is also possible, judging by analogy, that sudden variations from heat to cold and cold to heat, considerably affect them, and those who have reared aphides under observation, and with more or less artificial surroundings, are aware of the high rate of mortality. Apart from these circumstances there exist many active agents. Birds are often seen eating them (particularly the woolly aphid), beetles, and their larvae (ladybirds) feed upon them; the maggots of certain flies (*Syrphus*) destroy them, and they are often highly parasitized by minute wasps. Furthermore, under certain conditions they are often swept off by a fungus parasite (the peach aphid was destroyed during 1901 in Pietermaritzburg by a parasitic fungus).

It is generally conceded that a droughty season is an aphid season. Many accounts of aphid aggressiveness associate it with the dryness of the season; and of this we have an annual instance in the case of the cabbage and turnip aphid, which is more abundant and destructive in winter than in summer, and the intensity of whose attack seems dependent upon the plentifulness or otherwise of the autumn rains.

Although it is commonly thought that a drought favours the aphid, still

[*This aphid has been found feeding and procreating on green parts of frost-bitten amabele in Pietermaritzburg on the 20th June, 1903.]

there are good authorities who contend that it does not. Riley, in discussing the 1889 outbreak of the grain aphid in the United States, entered into this question, and, with the aid of meteorological statistics, showed that, although the season was droughty, it set in with a rainfall above the average. On this ground he contended that the aphid increased owing to the rains militating against its natural enemies, particularly the minute wasp parasites. This would appear a plausible argument, but it is not one which I care to apply in the case of the local outbreak of amabele aphid, although nothing was more conspicuous to the observer than the absence of parasites of this pest throughout the season; and, further, the fact that the season opened with rains above the average (November) and rapidly became drier.

My own opinion of this outbreak is that owing to the drought, which set in and became more marked with the progress of the season, the aphid escaped the attack of its fungus parasite, and so gained the destructive state in which it called so much attention on itself.

In conclusion, the following meteorological notes may be quoted in support of my contention that the climatic conditions favoured the increase of the aphid by checking its parasitic fungus.

At Eshowe the November rainfall for 1902 is .53 above the average for the past seven years (if the November rainfall of 14.53 in 1898 is omitted the fall is 1.79 above the average).

At Nonoti Peak it was .9 above the average for the past thirteen years.

At Stanger, 1.34 above the average for the past ten years.

At Tongaat it was 1.61 above the average for ten years past, and at Verulam it was 1.19 above the average for the same term. Thus at all five stations it was above the average for the planting month for the crop.

At the same stations, and for the same periods given, the December fall was below the average, being 1.31 at Eshowe, 1.63 at Nonoti Peak, 1.36 at Stanger, .96 at Tongaat, and .87 at Verulam.

At the same stations, and for the same periods, the January rainfall is the lowest recorded (except at Tongaat where a few points less were once recorded). At Eshowe the January fall was 2.20, and was 6.36 below the average (if the exceptional 22.17 fall of January, 1898, is omitted the fall is still 4.09 below the average). At Nonoti Peak it was 4.08 below the average; at Stanger, 3.01; at Tongaat, 1.85, and at Verulam, 1.46.

Passing Notes.

RINDERPEST IN WEENEN COUNTY.—In the minute of the Principal Veterinary Surgeon to the Minister of Agriculture, which will be found in the Veterinary Reports for the month of May, there are some observations on the recent outbreak of rinderpest in the Estcourt District.

CROSS-BRED WOOL.—It appears that what are known in the wool trade as Bradford 60's tops have for some time remained at a price which could not be made from the corresponding quality of fine merino wool. The explanation is curious, and illustrates the constant attention of manufacturers to produce substitutes or imitations from cheaper

raw material. By means of improved machinery the better cross-bred wools can now be made into 60's tops, a standard which has hitherto been regarded as that of fine merino. This fact will be of interest to the constantly increasing number of Natal farmers who are going in for English strains in their sheep.

GRASS-FED SHEEP.—The following is the Australian Sheepbreeders' Association's definition of "grass-fed" sheep:—All sheep entered as grass-fed shall be such as are grazed upon the permanent pasture growing on the property from which they are exhibited, and such sheep shall not be clothed, housed, hand-fed,

or fed in any other way from the date of the previous shearing up to and including the day of the show, excepting sheep that have been exhibited at previous shows during the year. Grass-fed sheep that have previously been exhibited at any show during the year, and have in consequence been housed, hand-fed, or fed in any other way, provided that such sheep are paddocked immediately after such show, will be accepted if a certificate from the secretary of such show accompanies the entry, stating that such sheep (giving marks and brands) have been exhibited as grass-fed and upon what date.

MARITZBURG SHOW.—The daily Press has given such full reports of the Maritzburg Show that general remarks at any length are now superfluous. It will be sufficient to say that in number the entries beat previous records, and that the weather was perfect throughout. The facilities of the new show ground for exhibitors, and the attractiveness of the locality and the arrangements for visitors, were fully realised. In general appearance a Home show ground was perhaps better than ever before brought to mind. The display of hunting gave an enlivening and holiday appearance, which should be suggestive to those who are responsible for country shows. This year the Society gave a ball instead of a dinner. The ball was a great success. It is perhaps to be regretted that a dinner—a comparatively small one—was not also given, because dinners, bad as agricultural show dinners usually are,

succeed to an astonishing degree in easily drawing offers of prizes for the following year's show. That is, however, about all that can be said in favour of a show dinner in Maritzburg, for with the abundant opportunities for social intercourse and entertainment always provided during show week, the dinner function is otherwise not needed. A good deal of the judging failed to give satisfaction, and probably for all time judging will be open more or less to this criticism. There is a point in this connection to which, we believe, the Committee of the Show might do well to give serious consideration, and that is the question of getting judges from outside the Colony. Our own may be of the best, but, unfortunately, however greatly they may strive to keep their minds free from bias and pre-conceived opinions as regards the merits of the animals they will be called on to appreciate, animals in many instances already well known to them, such detachment of mind is almost humanly impossible. And, again, it should be remembered that in confining the selection of judges to Natal less than a tenth of the population of South Africa is being drawn on. Judging is not merely a question of giving personal satisfaction to exhibitors, it is exclusively the whole foundation, it is the very "reason of being" of shows. The extra expense of getting judges from the Cape, Orange River Colony, or Transvaal should, we think, have no weight with the Premier Show of the Colony—a premiership that probably will never again be disputed.

Paspalum d. for the Dairy.

IN the *Agricultural Gazette*, N.S.W., for May last Mr. A. A. Dunctliffe, Inspector of Agriculture, N.S.W., Department of Agriculture, writes:—

I was much pleased with the illustrations of *Paspalum dilatatum* in the *Gazette* of March last. They show well the very rapid growth made by this valuable grass, under favourable conditions, although the results in the North Coast districts greatly exceed these. It is with-

out doubt the best grass the dairymen have at the present time for the production of both milk and butter, but I find it is little known except along the coast. As a stand-by for the stations, to be planted here and there, wherever suitable conditions occur, it would be found invaluable for cows and ewes and their young. As an illustration of rapid and vigorous growth, I send you the accompanying photo. I may say, in explana-

tion, that towards the end of October last I sent to the Hawkesbury Agricultural College for some roots of this grass. Although it was an unseasonable time for the removal of growing plants, I had sufficient faith in the robust vitality of the plant to risk the experiment. The said roots, however, from one unfortunate cause or another, could not be replanted until the end of November, by which time, as may be imagined, they were "pretty sick." They were then placed on Mr. Gatenby's Jemalong Station. Those showing any signs of

life were subdivided as far as practicable for the sake of getting the larger number of plants, and placed every 18 inches, in rows 27 inches apart. Within a week all, with the exception of about 3 per cent., were visible above ground. Each root had a quart of water when being set, and a light irrigation three weeks afterwards; beyond this no water and almost no rain, with a rather high temperature all the time. On February 28 many of the plants had thrown up over thirty strong stems with plenty of herbage, the ground being nearly one-third covered.

How to Milk.

THE following is a translation of a prize essay by a Danish student at an agricultural college in Denmark:—

The udder is, from the point of view of the milker, the cow's most important part. That a proper use develops the living instrument is a maxim which applies to the udder of a cow as well as to a multitude of other things. A workman knows that unusual labour causes a strain at first. The sower feels tired in his right arm, the harvester tired in the back, the milker tired in his arms and hands, etc., but before long they accomplish the one-sided work without feeling much strain or tiredness. Only the use which causes considerable exertion brings on further development.

The way to exert the udder is to milk it completely dry. The milker should irritate the greedy calf, which sucks the last drop of milk out of the teat. This causes a greater flow of blood to the glands of the udder, and it is from the blood that all material for further development and for the forming of more milk must be sought. It is in the above facts that one finds an explanation of the case (so common in Denmark) of the agricultural labourer's wife getting quite a lot of milk from her cow, which on a large farm would be found useless for the dairy. Whoever undertakes milking should certainly know the above facts.

The object of milking is to empty—as completely as possible—all the milk present in the udder, and in such a way that the cow finds it a pleasant sensation, and

that the milk is kept clean. The cow is by nature meant to nourish its young. We ought, therefore, to learn from the calf. The latter does not suck its mother in a brutal manner—on the contrary, it knows by instinct that if it wants milk it must behave properly. Therefore, it never grabs a teat at once, but asks, by touching the belly, and then the udder, if it may.

The milker ought to begin by speaking kindly to the cow, patting it, and afterwards with the back of the hand rubbing it gently on the belly and udder. By this means she not only puts the cow into a good temper, but the rubbing helps to get rid of loose hairs, scales, and dust, etc., which otherwise easily find their way into the milk pail.

Next, the milk pail is placed under the udder (always on the same side of the same cow), and the work is begun by catching hold round both the front teats with the whole hands. The hands are now in turn moved up against the udder with a gentle pressure, and they are then closed slowly and softly (likewise in turn) about the teat, the closing beginning at the top, and extending downwards. These gentle movements should be continued until one notices that the cow lets the milk "come." The milk must now be emptied out in long unbroken jets by means of the same movements of the hands as before, but applied with more vigour than at the beginning. For every fresh grip the hand ought to exert a new pressure up against

the udder, whilst at the same moment the first finger and thumb should grasp that portion of the udder which lies exactly above the teat.

During this part of the milking the conscientious milker ought to fix the whole of his attention on his work, since every interruption means a loss of milk. Hence all loud talk or noise, which disturbs the cow as well as the man, is to be strictly avoided. A good enlivening song need not, however, be out of place. When the front teats give no more milk, the work is carried on—without the preliminaries of patting, rubbing, and so on—in the same way as regards the back teats. The milk must be squeezed—not dragged—out of the teat. The teat should, therefore, be grasped with the whole hand, and the latter must not slide up and down the teat more than necessary.

The sort of milking which is carried out by grasping the top of the teat with the thumb and first finger, or thumb and second finger (the latter is the worse) and then pressing the fingers together, and dragging them down the teat, is very bad indeed. The cow does not like it, since it irritates the skin on the teat, and easily causes sores, and it is really much harder work for the milker. In the case of those heifers, however, whose teats are so short for the whole hand to grasp them, the fingers must, of course, be used. The milking is not over, even when the back teats (or the last milked) give no more milk. A vigorous second milking must now take place.

After one has again changed a few times from the first milked to the last milked teats and back again, the udder must be thoroughly “worked” by gentle handling, and afterwards the last drops of milk must be squeezed out of the teats. Here we could also learn from Nature. Look at the lamb when it sucks! See how it pushes its mother’s udder when the teat gives too little milk. The little pig can also be seen poking its mother by means of its soft snout, so as to get all the milk possible. One would also think that they found the last milk sweeter than the first! So they no doubt do, as it has been proved by a number of investigations that it is by far the richest.

If the first half-pounds of milk are mixed (equal amounts being taken from the four teats) from each of, say, forty cows the 20 lbs. of milk thus collected will, as a rule, not even produce half-a-pound of butter. But if in the same way one were to collect the last half-pounds, which after inadequate milking can still be worked out of the udders of the same forty cows, nearly 2 lbs. of butter can be got out of the 20 lbs. of milk. Any milker can roughly prove this for himself.

Collect the first jet from a teat in a small glass, and the last jet (or the last drops) which can be squeezed out of the same teat in another glass. Place the two small glasses in a cool place; and after twenty-four hours it is astonishing to see the great difference there is in the layer of cream. The first milk is only good skimmed milk, while the last is nearly thin cream.

Getting out all the possible milk is therefore of importance, not only for the development of the cow’s power of giving milk, but also for obtaining rich milk. Thus the milker who does not take sufficient time to milk the cow quite dry, either does not know her or his work, or is not carrying it out conscientiously. After the milking is finished, the cow should again be patted in a smooth way, and a kind word may again be said to her.

If a cow is milked three times in every twenty-four hours the milk obtained is both more abundant and richer than if milking takes place only twice a day. But whether one milks three times or only twice daily, the times between the milkings should always be as nearly as possible of the same length. The cow is a creature of habit; its udder works steadily and regularly. Hence the milking time should be most carefully kept, and the same pair of hands should milk the same cows in the same order. If milking is begun too late the cow becomes restless, and as regards those which give much milk the tension in the udder can give pain; in all cases milk is lost. Altogether it ought to be clearly realised that the cow repays all unpleasantness by giving less milk.

The Gardener's Wall.

Wauken, my muse! yer loodest wail,
Lend to proclaim the waeft' tale,
O' a' the ils that do assail

The gairdener's occupation.
If ere by chance ye meet a chiel,
Wi' careworn face an' een that reel.
An' doonbent head, then mark him weel—

His wark is cultivation.

Auld Milton said—I have heard tell
When Adam's curses cam' pell mell,
That maistly on the ground they fell,

As aff his heid they glinted,
I weel believe't: the son o' toil,
Wha's lot hae fa'en to till the soil,
For want o' care will never spoil—

His sorrow's never stinted.

Lang syne, when Adam sawed his seeds,
Ere he began his evil deeds,
He ne'er was bathered pu'in' weeds—

Sae says the auld narrator.
But noo, as sun's we tak' a spade,
An' get oor bit o' gairden made,
Gaints us we quickly find arrayed
The very pooers o' natur'.

If even the seasons had the grace
To come in turn an' keep their place,
We wadna' hae sae much to face,
Nor view wi' consternation
In summer, when we look for heat,
We're cursed wi' shooers o' hail an' sleet;
An' autumn's early frosts complete
The work o' devastation.

The hail has ruined oor crap o' Peas,
The blight has spoilt oor Aipple trees,
Oor grozers covered wi' green flees
An' then the festive snailes
Did quickly seal oor Cabbages doom;
Sma' wonner tho' we fret an' fume
To see oor best Chrysthan'mum bloom
Nabbed by the forkie-tailies.

Oor foes are mair than mind can grasp—
The grub, the weevil, bug, an' wasp,
Worms for the Carrot an' the Rasp—
In truth their name is legion.
But, faith, I'll shak' the gairden mud
Frae aff my feet afore I'm wud,
An' quickly pack ilk stick an' dud.
An' try some ither region.

Hortus, in the "People's Journal," N.B.

Keeping Mosquitoes at Bay.

THE cleanest and most effectual repellent—i.e., material which will keep off mosquitoes—is oil of citronella, which is an extract from a grass, *Andropogon nardus*, primarily used in the manufacture of cheap grades of perfumery. The odour is not unpleasant to most persons, is quite lasting, and absolutely keeps off all kinds of mosquitoes. Protected by this material, I have slept comfortably for an hour on a seashore piazza on an evening when everyone else was driven indoors. I have used it since 1897 on all my collecting trips, and no matter how large the swarm of mosquitoes surrounding me in the marshes or in the woods, none ever

alighted on any part of my body rubbed with the oil of citronella. Many others have used this material on my recommendation, and in all cases it has proved absolutely effective. It may be liberally applied on the hands and face, or other exposed parts of the body, but should be kept out of the eyes. On very hot days, or when one is perspiring freely, it causes a slight burning sensation on the skin of the face. So much superior is this to anything else known to me, that I do not consider it necessary to mention any of the other mixtures and compounds that I have seen and used.—The State Entomologist, New Jersey, in a report on mosquitoes.

A Chat with Mr. J. Medley Wood, A.L.S.

By ERGATES.

THERE are but few Colonists, and, indeed, but few South Africans, who take interest in botany, to whom the name of Mr. J. Medley Wood is not familiar. Mr. Wood is a botanist by inclination, is devoted to original research among nature's secrets in plant life, and happily is possessed of an eminently practical turn of mind which gives, when possible, a directly useful or commercial value to his work as a student and investigator.

EARLY DAYS.

Mr. Wood arrived in the Colony in 1852. His father, Mr. James Riddall Wood, was a Notary Public, and the first Deputy Sheriff for Durban. After stopping some nine months in Durban for the purpose of winding up the business of his father, who had just died, he left to try his hand at farming in the neighbourhood of Verulam. Up till then he had pursued a seafaring life, his last billet having been that of a mate on an East Indianman. What to grow was unknown in the early fifties. He began with mealies and beans. There was no money, so to say, in those early days, but yet all managed to live. The growing of arrowroot then attracted his attention. The late Mr. Thos. Reynolds was the first to produce it in quantity, and Mr. Wood and Mr. F. Clayton soon followed. Arrowroot paid very well for some years, but when the price of 6d. per lb. in England fell to 4d., and less, for the Natal product, the growing was no longer profitable. The drop was chiefly due to carelessness in preparation. "So far as I was concerned," said Mr. Wood, "the growing of the arrowroot was brought to an abrupt conclusion; the big flood of 1868 rotted the crop in the ground and carried away all my machinery."

"I then," he continued, "began sugar planting, having already grown a small quantity for the late Mr. William Campbell, of Muckleneuk. Sugar paid fairly well; the price was big, being over £20 per ton. I also grew castor oil,

Nicinus communis, and coffee. At first I cultivated the oil plant on hilly land, and at 5s. per gallon it paid well. I then planted out about 30 acres on a river flat: a frost came and killed all off. Soon afterwards the industry was put an end to by the importation of this oil from India and the East Coast. There is none better than we can make with our own common kind. The seed I started with came from Mashonaland; I bought it after much difficulty from a Zulu doctor who had been selling the seeds at 6d. each to Natives. I also got seed from India. I am not sure whether the cultivation would not pay now with cooler labour and improved facilities. The small quantity of coffee which I planted proved very profitable, but the borer soon came.

"My health at this time gave out, and I decided to go higher up country. I went to Inanda, about 1,800 feet above sea level, and was there for about ten years, when I was asked by the Committee of the Durban Botanic Gardens if I would take the curatorship of the Gardens. At first I declined, for I was averse to returning to the Coast climate, but eventually, owing to the fascination botany has always had for me, I decided to accept the appointment. Even when busy at making a living I found the greatest interest in examining every specimen of plant I came across, but of real botanic science I made no serious study until I went to Inanda. There I became an enthusiastic collector, and sent large numbers of specimens to Kew.

COFFEE DISEASE.

"About a year after I had returned to the Coast, when on a tour I discovered on some wild medlar trees near Port Shepstone a *Hemileia* fungus. This has been named after me—the *Hemileia Woodii*. I called the attention of some planters to the danger—Mr. Walter Bissett, D. C. Aiken and others—and strongly recommended them to destroy all the medlar plants in their vicinity, as I feared the fungus would spread to the

coffee plantations. Some weeks later the disease, the true *Hemileia vastatrix*, was found in Mr. Aiken's coffee, and a deputation—Harry Bissett and myself—put the matter before the late Sir Charles Mitchell. The Government agreed to buy the crop and destroy it. Unfortunately the roots were allowed to remain in the ground, and from that time the disease—the *Hemileia vastatrix* spread, and is still rampant."

SOME INCIDENTS.

In the course of our conversation, interesting and amusing incidents, often connected with other old Colonists, cropped up, but at the conclusion of practically all the narrator said: "Better not put that in." For only a couple of the earlier episodes could I gain permission for publication. When engaged in putting up his house on first occupying his farm in 1853, and still living in his wagon, a troop of five elephants passed during the night within fifty yards. A neighbour, who was supposed to be a daring Nimrod, joined Mr. Wood and his brother on the following morning for the purpose of tracking and killing the pachyderms. The track was followed for about three miles, and then—but it will be sufficient to say no elephants were killed that day. At this same time there was a man living near by who led a bushranging life. The name he went by was Roome; he was a man of superior attainments. His depredations were constant, but he never troubled the Woods. A neighbouring farmer having been relieved of several pigs by Roome was so exasperated that he complained to the authorities. As a result, three Native policemen arrived from Durban with a letter requesting the people in the vicinity to give them their assistance in arresting the depredator. Mr. Wood was away at the time, but his brother formed one of the party of six white men resolved on the arrest of Roome. They proceeded boldly until they were close up to the house. Here their boldness gave way to caution, for Roome with reckless and defiant aspect suddenly opened the door and stepped outside; a rifle was in his hands and a bowie knife was between his teeth. He

told the party briefly that before they should take him he would account for two of them, and would then take his chance. Obviously a parley became desirable; Mr. Galloway was the spokesman. The result was that Roome agreed to leave the district if Mr. Wood or his brother would promise to convey his wife and child in a cart to Durban. Roome left for the Transvaal and was never heard of in Natal again, and a subscription was got up in Durban for sending the wife and her child to her people in England.

THE HERBARIUM.

"On becoming the curator of these gardens—1st March, 1882—my first and most important object in view," said Mr. Wood, "was that of starting an Herbarium, for without one the name of Botanic Gardens was not justified. An herbarium, as you know, means in reality a dry garden, a garden that in a few minutes can be consulted by a botanist like a dictionary. It is true that a few plants had been gathered, but none had been either poisoned or named, and were of no real value. The real nucleus were a couple of cabinets I brought with me from Inanda. These specimens were chiefly native plants, some American, and a fair collection of native fungi. After a little time—in 1885—application to the Government for a grant in aid was made, and an annual grant of £30 was the result. Since then the herbarium has been practically a Government institution; the last two years the grant has been £300. On leaving the Colony Sir Henry Bulwer presented £40 to buy a microscope for the Herbarium. This gift was to me most gratifying. Whenever His Excellency might be in Durban he never failed to visit the Gardens. He was a keen and intelligent observer of plant life, and always anxious that the Gardens should be of economic value to the Colony. Of course the exceptional interest that he showed in my work I most highly appreciated. What is the extent of the Herbarium now? Well, from the original two cabinets the number has now increased to 48. Of foreign specimens they contain 19,330, and of South African 9,235. Every year

hundreds of plants were identified by me."

CANE SMUT.

While looking at a few of the methodically arranged 1,200 specimens of indigenous fungi of Mr. Wood's own collecting we came across one marked *Ustilago*. Thereby hangs the following tale:—In the eighties China cane was a popular one for growing on sandy flats. While still living at Inanda a friend informed Mr. Wood that a fungus had made its appearance on the cane at Umhlanga. "I immediately," remarked Mr. Wood, "pointed out the danger, and wrote to Kew. The reply was that they had never heard of the fungus—*Ustilago* attacking sugar cane. I brought the matter before the Inanda Planters' Association, and with the result that before the disease could spread to other varieties all the China cane was rooted out and destroyed."

DYSENTERY CURE.

Speaking about the medicinal values of indigenous herbs, Mr. Wood told me that one day he entered into a chance conversation with a visitor to the Gardens, Dr. Elliot, then of the Imperial Yeomanry Hospital, Deelfontein, and asked him to try *Monsonia biflora* in his cases of acute dysentery which proved intractable to the European treatment. The success, Dr. Elliot subsequently informed him, was in many cases complete. Mr. Wood observed that this plant is in common use among the Boers, and that it is most valuable in cases of acute tropical dysentery. The dysentery of England is different, and is amenable to the drugs commonly used there.

EXPERIMENTAL FARM.

In 1891 the Government appointed a Commission to report on the Durban and Maritzburg Gardens, one of the objects being to find out about experimental cultivation. Mr. Wood pointed out that under the financial and other conditions experimental work on a large scale would be impossible. Arising from this Sir Theophilus Shepstone, Colonel Bowker, and Mr. Wood went up country as far as Charlestown with the object of finding a suitable locality for an experimental farm. Eventually they decided

on a place between Nottingham Road and Mooi River. The report was drafted and copied out for signature, but owing to the sudden death of Sir Theophilus it was never actually signed.

NATAL PLANTS.

Asking Mr. Wood how he came to undertake the writing of his work entitled *Natal Plants*, he replied: "In 1896 Mr. Maurice Evans, who takes great interest in the Gardens, suggested to me that we should conjointly write a book on native medicinal plants. I declined, chiefly for the reason that the medicinal values of native drugs are but little understood by the Natives, and whatever value certain of them may have the Natives system of administering them is wholly mixed up with charlatanism and superstition. A few days later I suggested we should write a book on Natal plants, but, I added, there would be great difficulty. "What difficulty," he asked? "Expense," I replied. "How much would a volume of a hundred plates cost," he asked? "Two hundred pounds," I answered. To end the story, he said he would guarantee that sum, and thereupon we set to work on Volume I. After a few drawings had been made they were submitted to the Government, and the Government gave a grant in aid, and the further responsibility was taken by the Botanic Society, and Mr. Evans, of course, was relieved of his guarantee. On the completion of the first volume I continued the work, and am still at it. The second volume is devoted to grasses, and is half finished. The third volume is completed, and the fourth is begun. With the exception of the second volume on grasses, the others treat miscellaneous plants."

I must now bring this sketch to an end. Three weeks ago Mr. Wood, while searching for a book on a high shelf, fell from a ladder and broke a rib. Happily no serious consequences followed, and within a few days he was attending to all the work that was practicable from an invalid's chair. That he may live long and happily to continue the good and useful work which forms his greatest life's interest and pleasure, will be the hope of his many friends and admirers.

Veterinary Departmental Report for May, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of May, 1903:—

Scab.—Twenty-six fresh outbreaks have occurred during the month—Klip River County, 9; Weenen County, 5; Maritzburg County, 6; Alfred County, 1; New Territory, 1; and 1 in Zululand.

Lungsickness.—Ten outbreaks have occurred during the month—2 in Umsinga, 2 in Klip River, 2 in Zululand, 2 in Umlazi, 1 in Ixopo, and 1 in Vryheid District.

Redwater.—Two deaths have occurred during the month in the Newcastle Division. No deaths have been reported from the other parts of the Colony.

Anthrax.—One outbreak occurred in Upper Tugela Division; 3 deaths.

Glanders.—There has been a marked decrease in the number of cases. Four clinical cases have been destroyed during the month, and five which reacted to mallein.

Horsesickness.—Only four deaths from this disease have been reported during the month—3 in Pietermaritzburg and 1 in Verulam.

Fool and Mouth Disease.—No cases exist in Natal. The disease appeared in the vicinity of Capetown towards the end of April amongst cattle imported from Argentina per s.s. "Highland Corrie" and "Ormazon." The s.s. "Highland Corrie," after discharging her live stock at Capetown, came on to Durban. All her cattle fittings were destroyed and the ship thoroughly cleaned and disinfected before she was allowed to enter harbour and discharge her cargo of frozen meat.

The s.s. "Haversham Grange" also arrived at Capetown at a later date with foot and mouth disease amongst the stock on board. Her live cargo, fittings and deck hay were dealt with at Capetown. This vessel came on to Durban and was permitted to land her cargo of lucerne, mealies, and bran after the ship had been thoroughly cleaned and disinfected, and the holds well fumigated.

In view of these ships arriving with diseased stock at Capetown, it was anticipated that vessels with stock from the Argentine due to arrive at Durban would probably bring disease also. Instructions were accordingly given that no vessels might enter harbour until a clean certificate was given by the Veterinary Officer at the Port. On the 19th the s.s. "Abbey Holme" and "Anglo Chillian" arrived at the outer anchorage—the former vessel carrying 1,300 sheep and 300 bullocks, and the latter 2,000 sheep, 6 heifers, and a number of mules and horses.

Upon inspection it was found that foot and mouth disease existed amongst the sheep and bullocks on the "Abbey Holme," and amongst the sheep on the "Anglo Chillian," some 25 to 30 per cent. of the animals being affected, while many showed evidence of having suffered from the disease. Probably all the susceptible animals had been affected at the same time during the voyage, but when these ships arrived at Durban the disease had to a great extent run its course. We were informed that the disease appeared two days after the ships left the Argentine; the infection was, I should say, obtained in the compounds at Buenos Ayres where other diseased animals—those taken to the Cape—had been passed through. The mortality on these two ships was very small. All the acutely affected animals were destroyed, taken out to sea and thrown overboard. The balance were slaughtered for butcher purposes. Their heads, hoofs, and internal organs were thrown overboard, and all skins thoroughly disinfected. The slaughtering was carried out at the outer anchorage, and every precaution was taken to prevent infection being brought ashore by lighters. The horses and mules on the "Anglo Chillian" were dipped and landed by lighters. The whole of the fittings and deck fodder on each ship were taken to sea and thrown overboard. The ships were then thoroughly cleaned and dis-

infected and their holds well fumigated. They were then permitted to enter the harbour and discharge their hold cargoes. I think you will agree that we have dealt with these ships in such a manner as to guard against the introduction of disease at a minimum loss to shippers.

Rinderpest.—During the month one fresh outbreak of this disease occurred in Gayedi's Location, Krantzkop Division. Twenty deaths in all occurred during the month; at the end of the month two animals were sick. This outbreak is now finished. The quarantine at Hlatikulu, Estcourt Division, has been removed, the outbreak being over.

At Bursea (Comins's farm) there have been no fresh cases since the 17th May. In all 32 animals died. As regards Rinderpest in Zululand, I refer you to D.V.S. Tyler's report. With reference to the recent outbreaks in Estcourt Division at Hlatikulu and Bursea (Comins's farm), as they have received so much attention from the writer of "Farm Notes" in the *Times of Natal* and other individuals, I feel that I am called upon to make a few remarks and to place the true state of affairs before the public.

At Hlatikulu Rinderpest existed some five weeks before the owner of the cattle

Mr. J. W. Moor—notwithstanding his considerable experience, considered the symptoms sufficiently suspicious to report the case as probably Rinderpest. Cattle from this herd were moved by him along public roads in the vicinity. While sick animals existed at Hlatikulu Mr. Comins removed a herd of his cattle, which he had running there, to his farm Bursea. Mr. J. W. Moor, I understand, inoculated his cattle with serum, with success. The disease was in a very mild form. The disease at Hlatikulu spread from Rossendale to the adjoining farm, Sans Souci. Cattle on this farm were inoculated with glycerinated bile. Three were sick at the time; these recovered, and no further cases occurred. About a month after Mr. Comins had removed his cattle from Hlatikulu a calf broke out with Rinderpest. This calf was running with a herd of mixed cattle, amongst which were those that had come from Hlatikulu. This sick calf strayed

from this herd to the kraals where Mr. Comins kept his milch cows, thus carrying the infection there also. This is how both herds of cattle on the farm became infected. The second herd was not infected by glycerinated bile, as stated. There is no doubt that cases of Rinderpest occurred amongst the cattle which came from Hlatikulu before this calf was noticed to be sick, as the infection was brought from Hlatikulu, and the period of inoculation for Rinderpest had expired long before the sick calf was noticed. The cattle from Hlatikulu were in a paddock away from the homestead, and no herd boy was with them. Some animals must have been affected with a mild form of the disease without being noticed, and, in fact, the calf which died was probably only noticed to be sick because it came to the homestead when in that condition. One would have thought that, taking into consideration the place where these cattle had come from, the owner should have used every care to at once detect any animals which might become sick. It will thus be seen that both herds were infected before inoculation was resorted to, and that, in the case of the cattle from Hlatikulu, the infection must have been in existence for a month. I have advocated the use of serum and bile together in herds of cattle which are actually infected with the disease, as by this treatment the serum confers a quick immunity, which immunity is maintained by the bile. Mr. Moor was advised to do this when his cattle had the disease at Ennersdale last year; Messrs. Pepworth and Reid and others carried out this treatment with success, and it has been successfully carried out in Zululand. We have never claimed that bile is of much practical value as a curative agent, which appears to have been expected in this case. Glycerinated bile has been our sheet anchor for dealing with "in-contact" cattle which are not infected with the disease, and for conferring sufficient immunity to enable such animals to tide over the period that infection exists in the vicinity, without incurring any risk of conveying the disease. There is no case on record where glycerinated bile has conveyed the disease. The re-

sults of the use of bile in infected herds vary considerably. It is unreasonable to expect any immunising agent to check disease in a herd infected with disease for a long time. The immunity conferred by bile is established from the 7th to the 12th day after inoculation, and it is an unsatisfactory agent to use alone on cattle which have been infected for any length of time. The statement that the glycerinated bile increased the virulency of the disease is absurd. At the time that these cattle were inoculated at Bursea the infection in the one herd was nearing its height, and the virulency invariably increases as the disease progresses. For glycerinated bile to have been successful in this case it must have had curative properties which we do not claim for it. There is nothing surprising in a few animals breaking out with disease after inoculation amongst the milch cows. Here also the infection existed, through the calf, before inoculation was resorted to, but the bile must have had some immunising effect in this case, as it did at Sans Souci; all the bile used at Sans Souci and Bursea had a standard property, being of one lot. It may not be the experience of every one, but we cannot be guided by isolated cases, but from statistics of a large number of cases it is shown that bile immunity varies from the seventh to the twelfth day before being established, even in herds which are apparently healthy at the time of inoculation. If a herd, after inoculation with bile, is free from disease for sixteen days after the inoculation, the cattle may be considered safe for at least three months from that time. It should have been apparent to anyone that an agent which conferred a quick immunity was necessary in this case where the infection had existed so long. The period of incubation for Rinderpest under ordinary circumstances is up to sixteen days. Mr. Comins did not apparently use serum on the whole herd until the twelfth day. The mortality which occurred in this case might have been prevented to a considerable extent had the owner of the cattle exercised the discretion which we are entitled to expect from anyone who has been a cattle owner in this Colony for any length of

time, or who has taken the trouble to make himself acquainted with the current literature on the subject. It used to be thought that the immunity conferred by bile was established by the tenth day, but we have found from experience that it varies as stated above.

It is regrettable that the owner of the cattle should have rushed into print, and that the writer of "Farm Notes" should have given such prominence to the opinions expressed, which seek to condemn the glycerinated bile system because it has not fulfilled a condition which has never been claimed for it, viz.: that of being a curative agent of practical value. It is lamentable that a gentleman occupying the position of a corresponding expert of a widely read newspaper should betray such lack of knowledge of the subject upon which he presumes to offer an opinion. The gentleman who writes under the *nom de plume* of "Farmer" states that the Veterinary Department have never pointed out the value of serum from animals which salted during the '97 outbreak. Possibly this gentleman's opinion would have been somewhat modified if he had taken the trouble to read my report on Rinderpest, which appeared in the *Agricultural Journal* in April, 1902. In that report the following passage appears:—"It has been undoubtedly proved that cattle salted during the last outbreak of Rinderpest are still immune, and there are many such valuable serum cattle in the country."

S. B. WOOLLATT,

Principal Veterinary Surgeon.

P.V. Surgeon's Office,

Pietermaritzburg,

23rd June, 1903.

ZULULAND.—D.V.S. TYLER.

Rinderpest exists now at three centres in the Eshowe District. In all of these centres the Natives refuse to inoculate, and all that can be done is to maintain quarantine as strictly as possible and trust to the disease dying out.

Lungsickness.—Two fresh outbreaks of Lungsickness have been reported during May, and two licenses have been renewed, all these cases being in the Nqutu District.

Glanders.—Twenty horses were tested with mallein at Nongoma by me on 29th inst., with the result that four reacted and were destroyed, fourteen failed to

react, and two were put back for re-testing at a future date.

Rhodesian Tick Fever.—The result of my investigation into the disease reported to exist at Inguavuma, in which I subsequently found to be Tick Fever, has been made the subject of a special report to you.

Potatoes with Money in them.

A SELECTION OF CHOICE NEW VARIETIES LIKELY TO BE MOST REMUNERATIVE IN THE IMMEDIATE FUTURE.

MR. W. J. MALDEN, the Principal of the Colonial College at Hollesley Bay, Suffolk, has just issued a brochure with the above title, which should be of interest to all potato growers.

In the introduction the author explains that he has been in the habit for years of testing a great many new varieties of potatoes, and this led to his receiving so many enquiries on the subject that he decided to publish a summary of his results.

It is explained that new varieties can only be obtained by breeding from the flowers, the best results being obtained by careful crossing. Each plant produced from a seed may be a distinct variety, for each plant has its own characteristics. It is only occasionally, however, that one is found to possess sufficient merit for it to be cultivated extensively.

In the cultivated potato the tuber-producing power has been developed to some extent at the expense of other qualities, notably the power of resisting disease. A new variety has, as a result of the cross-breeding, special vigour, but this diminishes as years go on, even with the best variety, hence the necessity for constantly bringing out new kinds.

Principal Malden tells how his first experiment in developing from a single eye was many years ago in the case of the Up-to-Date, a small quantity of which he had bought at the rate of £168 per ton, and continues:—"Three years ago two varieties, The Empress Queen

and the Evergood, were placed on the market at £100 per ton, and have proved, and are proving, splendid investments. The greatest sensation, however, is the Northern Star, which was put on the market in 1901 at £1.120 per ton. So well has this variety done that it readily sells at the same price this year, and it is probable that it will fetch more when the planting season approaches. When it is remembered that it is easily possible to raise 100 lbs. from 1 lb. of sets, it is at once seen that the return for outlay and labour is without parallel in farming, for it gives £20 worth of crops from 10s. worth of seed.

The result is obtained by cutting out each eye separately. In dealing with 1 lb. of seed I cut out 168 eyes, which grew and produced plants yielding 418 lbs. of tubers. Each eye was placed in a pot (a shallow box would do) and subsequently transplanted into good garden soil, and then treated as any other potato crop would be. The reason for putting them into pots is to ensure insects being kept away, and to control them against frost."

The Sir John Llewellyn is the only First Early sort mentioned, the author being of opinion that it is the best First Early that has ever been put on the market.

The Sir John Llewellyn matures quite as early as the earliest in cultivation, and has the cropping and quality properties of the best Second Earlies. "I have never seen a diseased tuber.

although other varieties close by have been badly attacked. It is destined to be very largely grown, for it has given such universal satisfaction that there is a great demand for it, and its price is likely to remain high for some years. It has a good specific gravity for a First Early, and the flavour is excellent. It is universally admired, and in a few years it will undoubtedly be more grown than any First Early, and there must be much money in developing it.

"Ruby Queen is a purple, round, Second Early potato, somewhat flattish, growing a very neat and handsome sample. The flesh is very white, and the quality excellent. It is a great cropper. It has grown well with us on land heavily manured and lightly manured. It is worth the attention of developers, especially as its colour is popular in the Colonies; and it is far superior in all respects to the weak fleshed Early Rose varieties which have been shipped freely to South Africa."

We quote Mr. Malden's remarks on the Northern Star potato verbatim.

"This (Northern Star) is a potato which is attracting sensational attention. It was put on the market last year at 10s. per lb., or £1.120 per ton; this year it is selling freely at the same price, and is likely to rise in price as the planting season approaches. In trials at the Colonial College 418 lbs. of tubers were grown from 4 lbs. of sets cut to a single eye, and others report a heavier yield.

"It is a potato of very distinct habit of growth. The leaves are rough, and of a very marked green colour. We know of no variety which produces so much leaf surface in proportion to stem, and the cropping powers are doubtless due to this, because the leaves are practically the starch making laboratories.

"No potato withstood the attacks of disease as this did, although there were thirty varieties of high repute near.

"The tubers run from a full stone shape to a square-ended kidney. They make a very handsome sample; the skin is very good. The eyes are very shallow over the body of the potato, and a small collection at the rose end are the only

ones below the surface. It is white fleshed. As a means of identification, the eyes have reddish shoots.

"Although in its second year it possesses great possibilities for the developer, as there are few on the market, and it will be some years before it gets low enough in price for culinary purposes."

Of the Evergood the booklet continues: "We called very special attention to this potato last year, and it is doubtless destined to be grown on a very large scale. We should not be surprised if in a few years 100,000 acres of this crop were grown annually. We are not selling any seed, and shall grow 25 acres. Although this is its fourth year of development it is worth £20 per ton, and much more in smaller quantities. In view of the great growth that will be made in the future, we strongly recommend those who have it to grow all they can, and developers to get on it as soon as they are able. It is a late Second Early or early maincrop. It was put on the market three years ago at £400 per ton, and has been one of the best investments the developer has ever handled, and there is much money in it for years."

Other varieties mentioned are the Empress Queen, the Royal Kidney, the Goodfellow, the Colonist, which has red tubers and is recommended as a very robust potato for Colonial growth.

In the industry of destroying rabbits in Victoria 8,000 people are engaged, and 24,000 are dependent on it.

The "Review of the River Plate" states that "The Argentine Republic can export, without affecting its living capital, five times as much (meat) as at present. It can dispose of one million tons of meat, after providing for its own consumption." It goes on to refer to "the inexplicable conduct of the English War Office, which insists on the colonial meats, inferior to and dearer than ours, to feed their troops." Again, "we shall shortly be the principal providers of meat and bread of the world, able to control the present and future markets."



Photo by Editor

RAKING

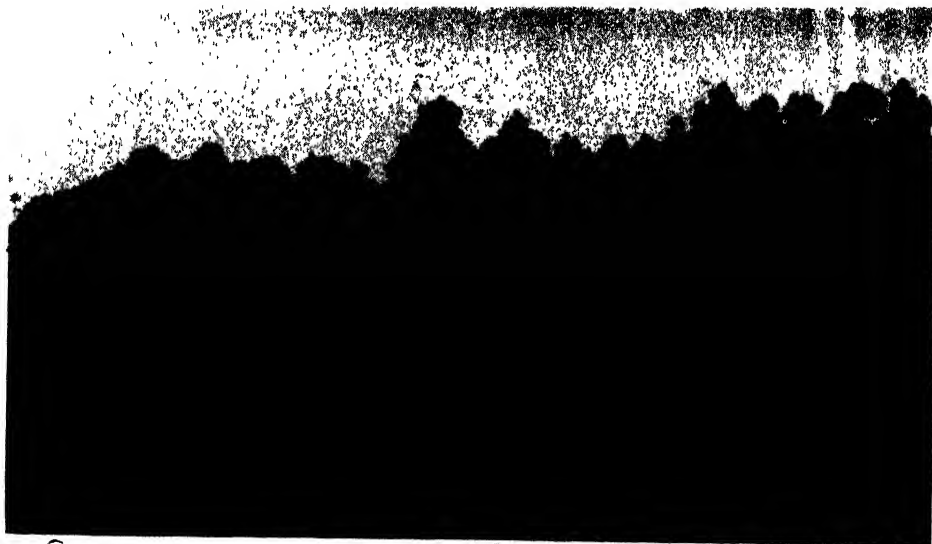


Photo by Editor

SLIPPING.

HAYMAKING IN NATAL.

City Agricultural Show.

PRIZE LIST.

The following are officials:—

Thoroughbred horses.—Judge, W H Buchanan; stewards, J Hall, Geo M Macdonald. Carriage horses.—Judge, Theo Woods; stewards, J Blackburn, H Solomon. Cart horses.—Judge, W T Woods; stewards, W Jackson, A Curry. Shorthorn cattle.—Judge, Jas King; stewards, C J King, R Cummings. Friesland cattle.—Judge, T J Nel; stewards, R J Spiers, P Otto, jun. Devon and general cattle.—Judge, Geo Ross; stewards, E Poole, T Westray. Kerry cattle.—Judge, Rev J Scott; stewards, H Baker, F North. Merino sheep.—Judge, G B Walker; stewards, H N Shaw, Bruce Taylor. Shropshire sheep.—Judges, W P Gibson and S Mare; stewards, W Taylor and W Woodhouse. Long-woolled sheep.—Judge, James Henwood; stewards, C W Holmes and G Moe. Goats.—Judge, Hon H D Winter; steward, J H Hosking. Pigs and slaughter stock.—Judge, Geo Young; steward, G S Bevis. Poultry.—Judge, W Dixon; steward, T H Hall. Pigeons and Rabbits.—Judges, W G Broadbent and H Porritt; steward, E W Smith. Dogs (sporting).—Judge, Major Lugg; stewards, R Holliday and H H Guthrie. Dogs (other than sporting).—Judge, A M Peters; stewards, H Loader and Geo Gibbon. Produce (grain).—Judge, J Marwick; stewards, G H Orchard, P H Campbell. Produce (roots).—Judge, T Morton; stewards, T Ross and C Baker. Foods and dairy produce.—Judge, Jno Harwin; stewards, J Morton, jun., and W T Adams. Working dairy.—Judge, E O Challis; steward, C Fuller. Apiarian section.—Judge, Inspector Stanley; stewards, H J Culverwell and Oswald Fynney. Furniture.—Judge, B S Kelly; steward, Frank Collier. Harness.—Judge, H J Stirton; steward, — Gibson, Frank Sullivan. Miscellaneous.—Judge, C W B Scott; stewards, Percy Mason and P K Francis. Implements.—Judge, John Moon; stewards, J A Hall and Jas Roberts. Carriages.—Judge, T K Clark; stewards, E Tooth and E G Burchell. Yard stewards.—D C Dick and W S Cratt; hall steward, J C Cope. For the third day's events the officials are:—Judges, Colonel McKenzie and P D Simmons; umpire, General Broadwood; stewards, D C Dick, J Hall, H Solomon, J Blackburn, and G M Macdonald; starter, Inspector George; timekeeper, H W Wade; outside exhibi-

bits, Judge, G Martin; steward, H Herbert.

The hon. secretary of the show is Mr. A. Whittle Herbert, and the assistant secretaries Messrs. Duff & Eadie.

The following is the prize list:—

HORSES.

Challenge Cup, value 25 guineas, presented by the M.L.A.'s for the City for the best animal entered in the Carriage and Saddle Section. The Cup to be won twice before becoming the property of the winner. To be judged by points: His Excellency the Governor.

Special prize, £10 10s., presented by Mr. F. G. Burchell, for the best Stud Horse, any breed: A. K. Murray, Nottingham Road, "Peterero."

Special prize, £10, presented by Mr. P. Davis, to go to winner of most points in Horse Sections: Samuel Welch.

Special prize, £10, presented by Messrs Lyle Bros, for the best Turn-out of Four-wheeled Carriage and Pair of Horses, to be colonial bred. Carriage and Harness to be made in the colony. Second prize, £5, presented by Messrs. W. Vickers & Co: 1, P Otto; 2, E A Foxon; highly commended, B Ireland.

Special prize, £5, presented by Messrs. W Vickers & Co, for best Two-wheeled Carriage and Horse. Carriage and harness to be made in the colony. Horse to be colonial bred: 1, Dr G E Oddin-Taylor; 2, T Guttridge; highly commended, H Guttridge.

Special prize, £5 5s., presented by P. Otto, Esq., J.P., for best pair Colonial bred Carriage Horses or Geldings: 1, P Otto; 2, E A Foxon.

Special prize, saddle value £5 5s., presented by Mr A Peel for best Natal bred Riding Horse: 1, E A Foxon.

Special prize, Gentleman's Dressing Case, value £3, presented by Messrs. J. Bennett & Co, Durban, for best Horse fed on Molassine meal, having won a prize in his class: 1, E P Robinson.

THOROUGHBRED ENTIRES.

Stallion, thoroughbred, imported or otherwise: 1, A K Murray; 2, E P Robinson; highly commended, H W and S M Smith; commended, E Parry.

Stallion, South African bred, 3 years old or upwards: 1 and 2, Sam Welch.

Colt, 2 years old, South African bred: 1, Dr Currie; 2, F P Woodhouse; highly commended, A Oliff; commended, G and B Hutchinson.

Colt, yearling, South African bred: 1, Sam Welch; 2, J Baikie; highly commended, Duncan McKenzie; commended, E P Robinson.

THOROUGHBRED MARES AND YOUNG STOCK.

Mare, imported, in foal or foal at foot, or having had a foal: 1 and 2, Sam Welch; highly commended, E P Robinson.

Mare, South African bred, in foal or foal at foot, or having had a foal: 1, E P Robinson.

Mare, imported or otherwise: 1, 2, and highly commended, Sam Welch; commended, C Woodhouse.

Filly, yearling, South African bred: 1, Sam Welch; 2 and highly commended, G and B Hutchinson.

Foal, colt, South African bred: 1, A Oliff; 2, Sam Welch; highly commended and commended, F G Burchell.

Foal, filly, South African bred: 1, E P Robinson; 2, Sam Welch.

CARRIAGE AND SADDLE ENTIRES.

Stallion, other than thoroughbred or cart, for which no special class is provided, imported or otherwise, 3 years or upwards: 1 and 2, W S Chart; highly commended, C Nicholson; commended, J Stone.

Hackney stallion, imported or otherwise: 1, R Abbot; 2, P D Simmons; highly commended, R Abbot.

Stallion, pony, 14.2 and under: 1 and 2, P D Simmons; highly commended and commended, Cecil Holliday.

CARRIAGE AND SADDLE MARES AND YOUNG STOCK.

Mare, other than thoroughbred or cart, for which no special class is provided, imported or otherwise, in foal or foal at foot, or having had a foal: 1, G Mattison; 2, J Paxton, jun; highly commended, P D Simmons; commended, J Baikie.

Hackney mare, imported or otherwise, in foal or foal at foot, or having had a foal: 1, P Otto; 2, G Mattison.

Yearling colt or filly, other than thoroughbred or cart, for which no special class is provided, South African bred: 1, A Otto; 2, P Otto; highly commended, G Mattison; commended, C P Spiers.

Foal, colt or filly, other than thoroughbred or cart, for which no special class is provided: 1, J Baikie; 2, Duncan McKenzie; highly commended, G Mattison; commended, P Otto.

Carriage horses, mares and geldings, pair of, shown in harness: 1, P Otto; 2, His Excellency the Governor; highly commended, E P Robinson.

Carriage ponies, mares or geldings, pair of, 14 hands and under, shown in harness: 1, B Ireland.

Carriage horse, mare or gelding, shown in harness: 1, Dr G E Oddin-Taylor; 2, R Otto; highly commended, J Stone; commended, P W Stride.

Cob, 14.2 and under, shown in harness: 1, Sir T K Murray; 2, S B Woollett; highly commended, His Excellency the Governor; commended, K H Hathorn.

Pony, 14 hands and under, shown in harness: 1, W H Buchanan; 2, Dan Taylor; highly commended, His Excellency the Governor; commended, S I Amos.

Saddle roadster, mare or gelding: 1, Otto Norton; 2, Corporation, Pietermaritzburg; highly commended, F A Verney.

Saddle cob, 14.2 and under: 1, J Paxton, jun; 2, Corporation, Pietermaritzburg; highly commended, Stephen Bell; commended, Mrs G E Oddin-Taylor.

Lady's hack, to be ridden by a lady when judged: 1, Mrs Agnes Spier; 2, W H Buchanan; highly commended, B Tilsone; commended, E A Foxon.

Polo pony, 14.1 and under: 1, Col Duncan McKenzie; 2, J W Johnstone; highly commended, Dr G E Oddin-Taylor; commended, J G Shaw.

CART ENTIRES.

Stallion, Clydesdale or Shire, imported or otherwise, 3 years and upwards: 1, H Blaker; 2, Duncan McKenzie; highly commended, P D Simmons; commended, E T Atkinson.

Stallion, South African bred, 3 years and upwards: 2, J W Johnstone.

Mare, imported or otherwise, in foal or foal at foot, or having had a foal: 2, Stephen Bell.

Mare, South African bred, in foal or foal at foot, or having had a foal: 1, H Blaker.

Foal, yearling, South African bred: 1, Colonel Duncan McKenzie.

Foal, colt or filly, South African bred: 1, Colonel Duncan McKenzie.

Cart horse, mare or gelding, to be driven in harness: 1, T H Hindle; 2 and highly commended, Corporation, Pietermaritzburg.

Pair trolley horses, to be driven in harness: 1, Corporation, Pietermaritzburg.

MULES.

Best pair of mules, in harness: 1, J A Peters; 2, Corporation, Pietermaritzburg.

CATTLE SECTION. SPECIAL PRIZES.

Challenge cup, value 50 guineas, presented by Mr G Angus, for the best family group of cattle: 1, Jas Ross, Devons.

Special prize, £10 10s, for the best beast in the yard. Presented by Mr P D Simmons: 1, Jas Ross.

Special prize, silver cup, for the best shorthorn bull in the yard (£10 10s). Presented by Mr Orlando Hosking: 1, O Hosking.

Special prize, silver cup, £10 10s, for the best two Shorthorn cows in the yard. Presented by Mr O Hosking: 1, P D Simmons.

Special prize, silver cup, £5 5s, for the best two Shorthorn yearling heifers in the yard. Presented by Mr O Hosking: 1, P D Simmons.

Special Prize, £10 10s, presented by Messrs Simmer, Jenkins & Co, for the best colonial bred cow: 1, Jas Ross.

Special prize, cup, value £5 5s, presented by Messrs Musson, Denby & Greene, for the best colonial bred yearling heifer, any breed: 1, P D Simmons.

Special prize, £5 5s, presented by Messrs D Whitelaw & Sons, for the best colonial bred milch cow: 1, J Campbell.

Special prize, presented by Messrs J Bennett & Co, Durban, gentleman's dressing case, value £3, for the best beast fed on Molassine meal, having won a prize in its class: 1, Jas Ross.

Shorthorn bull, pure-bred, imported or otherwise: 1, O Hosking; 2, R Garland; highly commended, C Groom; commended, P D Simmons.

Bull, grade, South African bred: 1, A W Simmons; 2 and 3, R Garland.

Calf, under 12 months, South African bred: 1, O Hosking; 2, R Garland; highly commended, O Hosking; commended, R Garland.

Cow, pure-bred, imported or otherwise: 1 and 2, P D Simmons; highly commended, P D Simmons; commended, O Hosking.

Cow, grade, South African bred: 1, R Garland; 2, P D Simmons; highly commended, P D Simmons; commended, P D Simmons.

Heifer, under 3 years old, South African bred: 1 and 2, R Garland; highly commended, O Hosking; commended, P D Simmons.

Heifer, under 2 years, South African bred: 1, P D Simmons; 2, R Garland; highly commended, R Garland; commended, P D Simmons.

Heifer calf, under 12 months, South African bred: 1, O Hosking; 2, P D Simmons; highly commended, P D Simmons; commended, O Hosking.

Friesland bull, pure-bred, imported or otherwise: 1, G C McKenzie; 2, P Otto; highly commended, Jas Henwood; commended, E Shackelford, jun.

Bull, grade, South African bred: highly commended, E G Mendenhall.

Bull, yearling, South African bred: 1, C Giles; 2, J Campbell.

Cow, pure-bred, imported or otherwise: 1 and 2, P Otto; highly commended, J Campbell.

Cow, grade, South African bred: 1, Moe Brothers; 2, J Campbell; commended, J Campbell.

Heifer, under 3 years, South African bred: 1, C Nullah; 2 and highly commended, P Otto.

Heifer, under 2 years, South African bred: 1 and 2, J Campbell; highly commended, Moe Bros; commended, P Otto.

Heifer calf, under 12 months, South African bred: 1, P Otto; 2, W H Currie; highly commended, Moe Bros; commended, P Otto.

Devon bull, pure bred, imported or otherwise: 1, W J Slatter; 2, B Greene; highly commended, Jas Ross.

Bull, grade, South African bred: 1, Jas Ross; 2, B Greene.

Bull, yearling, South African bred: 1, Duncan McKenzie; 2, Jas Ross.

Bull calf under 12 months, South African bred: 1, Jas Ross; 2, Duncan McKenzie; highly commended, Jas Ross.

Cow, pure bred, imported or otherwise: 1, Duncan McKenzie.

Cow, grade, South African bred: 1 and 2, Jas Ross; highly commended, B Greene.

Heifer, under 3 years, South African bred: 1, Jas Ross; 2, B Greene; 3 and highly commended, Jas Ross.

Heifer, under 2 years, South African bred: 1 and 2, Jas Ross; highly commended, W J Slatter; commended, B Greene.

Heifer calf, under 12 months, South African bred: 1, Jas Ross; 2, Duncan McKenzie; highly commended, Jas Ross; commended, B Greene.

KERRY COWS.

Kerry cow, grade, South African bred: 1, R Otto; 2, L Bayhs; highly commended, C Nullah.

Heifer, under 2 years, South African bred: 1, C Nullah.

Channel Island bull pure bred, imported or otherwise: 1 and 2, T H Hindle; highly commended and commended, B Ireland.

Cow, grade, South African bred: 1, C Nullah; 2 and highly commended, T H Hindle.

Heifer, under 3 years, South African bred: 1 and 2, T H Hindle.

Heifer, under 2 years, South African bred: 1, C Nullah.

Bulls, other breeds, over 12 months and under 2 years. South African bred: 1 and 2, R Garland.

Cows, other breeds, South African bred: 1, B Ireland; 2, C Nullah.

Heifer, South African bred, over 2 years and under 3 years: 1 and 2, R Garland.

Heifer, under 2 years, South African bred: 1, R Garland; 2, C Nullah.

Ox, slaughter, shown by butcher: 1 and 2, E Turnbull & Co; highly commended, E A Foxon.

Ox, slaughter, butchers debarred: 1, E A Foxon; 2, E G Mendenhall.

SHEEP AND GOATS.

MERINOS.

Special prize, silver cup, value £5 5s, for the best ram in the yard: P D Simmons.

Special prize, silver cup, value £7 7s, for the best three ram lambs lambd in September, 1902, offered by Mr W Watson, J.P.; P D Simmons.

Ram, imported or otherwise: 1, P Otto; 2, J Paxton, jun; highly commended, H Turner.

Ram, South African bred, 4 tooth and over: 1, J Paxton, jun; 2, E J Van Rooyen; highly commended, H Turner.

Ram, South African bred, shearling: 1, H Turner; 2 and commended, J Paxton, jun.

Three Ram Lambs, born before August 1st, 1902, South African bred: 1, R Garland; 2 and highly commended, J Paxton, jun.

Three Ram Lambs, born after August 1st, 1902, South African bred: 1, P Otto; 2 and highly commended, J Paxton, jun.

Two Ewes, imported or otherwise: 1, P Otto; 2, H Turner; highly commended, J Paxton, jun.

Two Ewes, South African bred, 4 tooth and over: 1, P Otto; 2, E J Van Rooyen; highly commended, H Turner; commended, R Garland.

Two Ewes, shearlings, South African bred: 1, H Turner; 2, J Paxton, jun.

Three Ewe Lambs, born before August 1st, 1902, South African bred: 1 and 2, P Otto; highly commended, R Garland.

Three Ewe Lambs, born after August 1st, 1902, South African bred: 1, P Otto; 2, H Turner; highly commended and commended, J Paxton, jun.

Group, containing Ram, Ewe, Ram lamb, Ewe Lamb, South African bred: 1, H Turner; 2, E J Van Rooyen.

SUROPESHIRE DOWNS.

Ram, imported or otherwise: 1 and 2, P D Simmons; highly commended, P D Simmons.

Ram, South African bred, 4 tooth and over: 1, P D Simmons.

Ram, South African bred, shearling: 2, G F Woodhouse.

Three ram lambs, born before August 1st, 1902, South African bred: 1, P D Simmons.

Three ram lambs, born after August 1st, 1902, South African bred: 1, P D Simmons; 2, G F Woodhouse.

Two ewes, imported or otherwise: 1 and 2, P D Simmons; highly commended, G F Woodhouse; commended, R Garland.

Two ewes, South African bred, 4 tooth and over: 1 and 2, R Garland; highly commended, P D Simmons; commended, P D Simmons.

Two ewes, shearlings, South African bred: 1, G F Woodhouse; 2, P D Simmons; commended, P D Simmons.

Three ewe lambs, born before August 1st, 1902, South African bred: 1, P D Simmons.

Three ewe lambs, born after August 1st, 1902: 1, P D Simmons; 2, G F Woodhouse.

Group, containing ram, ewe, ram lamb, and ewe lamb, South African bred: 1, P D Simmons.

LONG WOOL SHEEP.

Ram, imported or otherwise: 1 and 2, R Abbot.

Two ewes, imported or otherwise: 1, R Abbot; 2, H Turner.

Two ewes, South African bred, four-tooth and over: 1, H Turner.

Two ewes, shearlings, South African bred: 1 and 2, H Turner.

Three ewe lambs, born after August 1st, 1902, South African bred: 2, H Turner.

CROSS BRED SHEEP.

Two ewes, South African bred: 1, R Garland; 2, G F Woodhouse; highly commended, P D Simmons; commended, H Turner.

Two shearling ewes, South African bred: 1, G F Woodhouse; 2, R Garland; highly commended, P D Simmons.

Three ewe lambs, born before August 1st, 1902, South African bred: 1, P D Simmons.

Three ewe lambs, born after August 1st, 1902, South African bred: 1, G F Woodhouse; 2, P D Simmons; highly commended, H Turner.

FAT SHEEP.

Ten fat sheep, South African bred, to have been shorn within two months of show: 1, P D Simmons.

Ten fat sheep, South African bred: 1, G F Woodhouse.

Angora ram, imported or otherwise: 1, E J Van Rooyen; 2, H Illing; highly commended, J and D Bester.

Angora ram, South African bred: 1, J and D Bester; 2, H Illing; highly commended, J and D Bester.

Three Angora ewes, South African bred: 1 and 2, J and D Bester; 3, H Illing.

PIGS.

Special prize, value £1 1s., presented by Messrs Nathan Bros, for best pig on the Show.

Boar pig, Yorkshire whites: 1 and special prize, Cope & Fisher.

Two porkers, not exceeding 80lb each, live weight. First prize presented by Messrs Williams & Lambert: 1, T H Hindle; 2, T R Atkinson.

POULTRY AND RABBITS.

There were a great many entries under this head, and the exhibits were good. Most of the prizes were carried off by Maritzburg people.

Special prize, £5 5s., presented by Messrs Mason & Co, tailors, to go to the winner of most points in Classes 144 to 173: Cope & Fisher.

Geese, one pair: 1, A E Goodwill; 2, T H Hindle; highly commended and commended, Cecil Holliday.

Turkey cock and hen: 1, A E Goodwill; 2, W Clark.

Brahmas, high, pair: 1, J E Servant.

Fowls, game, Indian, pen of: 1, Cope & Fisher; 2, Wm Cook & Sons; highly commended, Howard Hathorn; commended, T H Hindle.

Fowls, Leghorn, white, pen of: 1, Cope & Fisher; 2, F W Merryweather; highly commended, R James; commended, W Cook & Sons.

Fowls, Leghorn, brown, pen of: 1, R Lacy Chapman; 2, J E Servant; highly commended, W Cook & Sons; commended, C Baylis.

Fowls, black Orpingtons, pen of: 2, B Ireland; highly commended, W Cook & Sons; commended, B Ireland.

Fowls, buff Orpingtons, pen of: 1, W Cook & Sons; 2, Cope & Fisher; highly commended, W Cook & Sons; commended, C Baylis.

Fowls, Plymouth Rocks, pen of: 1, W Cook & Sons; 2, J E Servant; highly commended, T H Hindle; commended, P H Campbell.

Fowls, Wyandottes, pen of: 1 and 2, C Baylis; highly commended, J Finn; commended, W Chapman.

Fowls, Spanish, pen of: 1, P H Campbell.

Fowls, Minorcas, pen of: 1, B Ireland; highly commended, W Clark; commended, Thos Wharton.

Fowls, Andalusians, pen of: 1, 2, and highly commended, J Campbell.

Fowls, any other variety, pen of: 1, Cope & Fisher; 2, J Finn; highly com-

mended, W Chapman; commended, Cope & Fisher.

Fowls, best 6 cross bred cockerels, for table purposes: 1, C P Spiers; 2, T H Hindle; highly commended, C Baylis; commended, T R Atkinson.

Best 6 cross bred pullets, for table purposes: 1, Cope & Fisher; 2, T H Hindle.

Ducks, Aylesbury, one pair: 1, Cope & Fisher; 2, H H Swegmann; highly commended, Fred Chapman; commended, Wm Cook & Sons.

Ducks, Muscovy, one pair: 1, P Bromfield; 2, W J Galloway; highly commended, P H Campbell; commended, T R Atkinson.

Ducks, Pekin, one pair: 1, W Chapman; 2, H Turner; commended, J E Servant.

Ducks, Rouen, one pair: 1, H H Swegmann; 2, C Baylis; highly commended, Wm Cook & Sons.

Ducks, Indian runners, one pair: 1, H H Swegmann; 2, W J Galloway.

Bantams, pen of: 1, W Chapman; 2, Cope & Fisher; highly commended, J Robinson; commended W Chapman.

Pigeons, pair of show homers: 1 and 2, E Whittett.

Pigeons, pair of flying homers: 1, L F R Kelly; 2, W Berriman; highly commended, J E Servant; commended, Cope and Fisher.

Pigeons, pair of dragons: 1, E Whittett.

Pigeons, pair of fantails: 1, J E Servant; 2, W P Gough; highly commended, Lewis Crarl.

Pigeons, pair of Jacobins: 1, A F Goodwin; highly commended, R Berriman.

Pigeons, pair of tumblers: 1, W P Gough; 2, A Berriman; highly commended, A H Campbell.

Pigeons, any other named variety: 1, and 2, T H Hindle.

Belgian hares: buck and doe: 1, T H Hindle; 2, Frank North; highly commended, T H Hindle; commended, Cope and Fisher.

Flemish giants: 1, J Finn; 2, Cope and Fisher.

EXTRA EXHIBITS.

Special prize, Mrs W Harrison, Persian cat; 2nd, W G Stacey, guinea pigs; 2nd, H Turner, guinea fowls; highly commended, H Turner, guinea fowls.

DOGS.

The total exhibit in the dog section reached a good numerical strength, seeing that dogs are, after all, more or less a side show. The main body of this section was comprised of terriers (Irish and Fox) and collies. In the fox terrier (smooth) class Mr

Crosby Wade, Durban, secured first prize with Nepeote Warrant, but Miss B M Taylor kept the prize for the rough in Pietermaritzburg, with Lord Yealand. There were a few dogs in the Irish terrier section that stood out amongst their fellows, and the first two were very clearly entitled to their places. Mr J Finn (P.W.D.) got premier place with Brunsell Kathleen, which has already won him several prizes. She is an exceedingly pretty bitch, but somewhat light in bone. She is of the old-fashioned red colour, though the fancy has now changed round to wheaten. She has a perfect eye, and a coat of excellent fibre. Mr J Harris, 148, Pietermaritz-street, ran the winner close with a young bitch, Bridget Rhua. The latter has a beautifully shaped head, with excellent ears, but fails to the winner in the eye and quality of her coat. Mrs Stewart won with her collie, and Mr Crosby Wade won first prize and the special for the best dog on the show with Prickly Pear.

Special prize, £5 5s, presented by Mr. Frank Stevens, C.M.G., for the best dog on the show: Won by Crosby Wade.

Mastiff or bloodhound: 1, C B Lloyd; highly commended, Reg Holloway.

Boarhound: 1, Dan Taylor; 2, Frank Collier.

Newfoundland (or other large breed): 2, A Berriman.

Kangaroo hound and rough greyhound: 1, C R Waugh; 2, W F Knapp; commended, G Posnot.

Greyhound (smooth): 1 and 2, J Killner; highly commended, A Berriman.

Bull dog: 1 and special as best dog on show, R Crosby Wade; 2, J Dennis Coyne.

Collie, sable: 1, Mrs Joyce; 2, C H Medlin; highly commended, W E Bowermann; recommended for 3rd prize, Mrs W Middleton.

Collie, black-and-tan: 1, Mrs James Stewart.

Pointer: 1, P Otto; 2, H.E. the Governor; 2 and highly commended, W J Gallwey; highly commended, Edward Ingelbrekston.

Pomeranian: 1, Mrs D A B Lindsay; 2, A Blackmore; commended, George Robertson.

Retriever: 1, Mrs J W Tainton; 2, J Douglas.

Setter, Irish: 1 and 2, A Otto; highly commended, W J Gallwey.

Setter, Gordon: 1, G and B Hutchinson; 2, Sir T K Murray.

Spaniel: 1, F A Sams; 2 and highly commended, Mrs E A J Bolton; commended, F E Peters.

Terrier, bull: 1, J W Sparks; 2, W R Thompson; highly commended, Frank North.

Terrier, fox: 1, R Crosby Wade; W Burton, Durban, and S T Amos, Durban, were equal for third prize; highly commended and commended, J E Peters.

Terrier, rough: 1, Miss B M Taylor.

Terrier, Irish: 1, J Finn; 2, J F Harris; recommended for third prize, Theo Masson; highly commended, C J Weatherdon.

Terrier, Airedale: highly commended, H J Shanahan.

Toy dog (smooth-haired): 1, W J O'Brien; 2, H W Barnard; highly commended, J H Goddard; commended, B E Peters.

Toy dog (long-haired): 1, Mrs Foster; 2, J Campbell; highly commended, Mrs M F Phipson.

EXTRA EXHIBITS.

1, A M Peters; 2, J W Sparks; 2, A M Peters; highly commended, Mrs Weighton; commended, Mrs Weighton.

PRODUCE.

Special prize, £3 3s, presented by Mr P F Payn, for best muid of mealies, grown in the Umgeni Division: 1, T H Hindle.

Wheat, any other variety, 2 muids: 1, The Trappists, Polela.

Barley, 1 muid: 1, H Turner.

Mealies, white, Horsetooth, 2 muids: 1, T H Hindle; 2, A N Green; 3, J A Westbrook.

Mealies, white, Hickory King, 2 muids: 1, T H Hindle; 2, H Baker; 3, J Baikie; highly commended, G & B Hutchinson; commended, T R Atkinson.

Mealies, yellow, flint corn: 1, T H Hindle; 2, R H Oellermann.

Mealie, yellow, dent corn: 1, T H Hindle; 2, R H Oellermann; 3, G & B Hutchinson.

Mealies, white, Horsetooth, on cob: 1, R Mattison; 2 and highly commended, J A Westbrook; commended, Moe Bros.

Mealies, white, Hickory King, on cob: 1, R J Speirs; 2, T H Hindle; highly commended, H Baker; commended, J A Westbrook.

Mealies, yellow, flint corn (8-rowed), on cob: 1, T H Hindle; 2, R H Oellermann; highly commended, R J Speirs.

Mealies, yellow, dent corn, on cob: 1, R H Oellermann; 2, T H Hindle; highly commended, J A Westbrook.

Oats, Tartarian, 150lbs: 1, H Brown.

Oats, Sidoman, 150lbs: 1, H Brown; 2, H Turner.

Oats, any other variety, 150lbs: 1, H Brown; 2, H Turner.

Beans, Canadian Wonder, 1 muid: 1, T H Hindle; 2, J A Westbrook; highly commended, C R C Acutt.

Beans, white, 1 muid: 1, The Trappists; Polela; 2, T H Hindle; highly commended, C R C Acutt.

Beans, any other colour, 1 muid: 1, R J Spiers; 2, J A Westbrook.

Buckwheat, 1 cwt: 1, H Turner.

Buckwheat, Japanese, 1 cwt: 1, C R C Acutt; 2, T H Hindle; highly commended, H Turner.

Peas, 1 muid: 1, C R C Acutt; 2, T H Hindle.

Linseed, 100lbs: 1, H Turner; 2, T H Hindle.

Potatoes, Up-to-date, 1 muid: 1, R J Spiers; 2, T H Hindle; highly commended, C J Spiers; commended, H Brown.

Potatoes, Beauty of Hebron, 1 muid: 1, T H Hindle; 2, C Shackleford; highly commended, C R C Acutt.

Potatoes, Magnum Bonum, 1 muid: 1, Wm Teasdale; 2, T H Hindle; highly commended, Orlando Hosking.

Potatoes, early Rose, 1 muid: 1, C R C Acutt; 2, E Shackleford; highly commended, R J Spiers; commended, T H Hindle.

Potatoes, Main Crop, 1 muid: 1, T H Hindle.

Potatoes, Reliance, 1 muid: 1, Orlando Hosking.

Potatoes, Imperator: 1, Orlando Hosking.

Potatoes, any other kind (not otherwise provided for), 1 muid: 1, C R C Acutt; 2, H Brown; highly commended and commended, T H Hindle.

Sweet potatoes: 1, T H Hindle; 2, Cope & Fisher.

Mangolds, 100 lbs: 1, T H Hindle; 2, C R C Acutt, highly commended, T H Hindle.

Sugar, beet, 100 lbs: 1, T H Hindle.

Turnips, Swede, 100 lbs: 1, D C McKenzie; 2, T H Hindle; highly commended, J F Potterill; commended, Orlando Hosking.

Turnips, field, 100 lbs: 1, T H Hindle; 2, H Turner.

Forage or oat hay, other than Cape, 100 lbs: 1, H Brown; 2, F J Clark; highly commended, W A Deane; commended, Chas L Lund.

Manna hay, 100 lbs: 1, G W Teasdale.

One ton Natal hay, 100 lbs to be shown: 1, G W Teasdale; 2, H H S Morland; highly commended, J Moon; commended, H H S Morland.

Sugar canes, with tops, grown in the County: 1, E F Ford; 2, J Moon, highly commended, T H Hindle.

Fruits, ripe, not less than 6 varieties: 1, S Todd & Sons; highly commended, E F Ford.

Tomatoes, 100 to be shown: 1, Cope and Fisher; 2, S Todd & Sons.

Oranges, 100 to be shown: 1, P H Campbell; 2, H Oliver; highly commended, The Trappists; commended, S Todd & Sons.

Naartjes: 1, P H Campbell; 2, S Todd & Sons; highly commended, R H Pepworth.

Lemons: 1, R H Pepworth; 2, P H Campbell; highly commended, E F Ford; commended, S Todd & Sons.

Pineapples: 1, S Todd & Sons.

Best case of fruit packed for market: 1, R H Pepworth.

Best case of fruit packed for export: 1, R H Pepworth.

Best collection of cut flowers, open to amateurs only: 1, P H Campbell; 2, Miss F Green.

Vegetables, best variety: 1, The Trappists.

Pumpkins, 6: 1, C Nulliah; 2, R H Oellermann; highly commended, T R Atkinson; commended, T H Hindle.

Extra exhibits: 1, T H Hindle, goat rabbi; 2, T R Atkinson, melons and marrows; highly commended, James Weddell, ostrich feathers; highly commended, C Holcomb, organs, &c. special, Natal Estates, Ltd, show case of Natal sugar.

DAIRY PRODUCE, FOODS, ETC.

Special prize, £5 5s, presented by the Hon C J Smythe, Colonial Secretary, 25lb of butter, in pats: 1, E Kemp.

Special prize, cup, value £5 5s, presented by Messrs W H Griffin & Co, 12lb butter in pats: 1, E Kemp.

Special prize, £5 5s, presented by Mr Justice Campbell, for best exhibit of preserved fruits, etc: 1, Mrs J A Westbrook.

Special prize, £5 5s, presented by Mr Justice Finnermore, to go to the winner of most points, butter and cheese classes: 1, Jas Cole.

Special prize, chest of drawers, value £5 5s, presented by Mr J W Reid, cabinetmaker, for best exhibition of cakes and pastry; confectioners deburred: 1, Mrs R Simpson; 2, Miss May Herbert.

Arrowroot: 1, The Trappists.

Ham, two, to be not less than eight months old: 1, Wm Teasdale; 2, R J Spiers.

Lard, 20lb: 1, Miss F E Walker; 2, Mrs A W Herbert.

Beef, salt, not less than 100lb: 1 and 2, E Turnbull & Co.

Sausages, 10lb: 1 and 2, E Turnbull & Co; highly commended, Miss F E Walker.

Bread, home made, 3lb white loaf: 1, The Trappists; 2, C R C Acutt; highly

commended, Mrs W H Walker; commended, Mrs G T Hesom.

Bread, brown, home made, 3lb. loaf: 1, Miss E Ireland; 2, Mrs W H Walker; highly commended, Mrs R Simpson; commended, Miss Teasdale.

Fowls' eggs, 1 dozen, judged by weight: 1 and 2, W Chapman; highly commended, Miss E Teasdale; commended, Mrs T R Atkinson.

Pair of dressed fowls for table: 1, Miss F E Walker; 2, Mrs T R Atkinson; highly commended, Thos Dawson; commended, H H Schwegmann.

Pair of dressed ducks for table: 1, Mrs T R Atkinson; 2, H H Schwegmann.

Dressed turkey for table: 1, Mrs T R Atkinson; 2, H H Schwegmann.

Dressed goose, for table: 1, Mrs T R Atkinson.

Cheddar cheeses, 3, to weigh not less than 35 lb each: 1, Louis D Gilson; 2, Jas Cole.

Cheddar cheeses, 3, to weigh not less than 20 lb and not more than 30 lb each: 1, Jas Cole; 2, Louis D Gilson; highly commended, The Trappists.

Cheeses, 6, any variety, to weigh not less than 6 lb. and not more than 15 lb each: 1, The Trappists; 2, Jas Cole, highly commended, Louis D Gilson.

Fruit, dried, 50 lbs: 1 and 2, The Trappists.

Fruit, preserves, best collection, not less than six varieties, in merchantable condition, fit for market: 1, Mrs R Simpson; 2, J A Westbrook.

Fruits, in syrups, 12 samples, not less than 6 varieties, in merchantable condition, fit for market: 1, Mrs R Simpson; 2, J A Westbrook; highly commended, Mrs F A Sams.

Collection of home made preserved fruits, jams, jellies, crystallised fruits, etc: 1, Mrs R Simpson; 2, Mrs A W Herbert; highly commended, J A Westbrook.

Coffee, 500 lbs: 1, St George Arbuthnot.

Tea, best sample of 1 cwt: 1, Mrs J A McMillan; 2, C Ashwell.

Vacuum pan sugars, white crystal: 1, Natal Estates Co, Ltd.

Vacuum pan sugars, yellow: Highly commended, Natal Estates Co, Ltd.

Vacuum pan sugar, first treacles: 1, Natal Estates Co, Ltd.

Golden syrup, in tins and bottles, 1 dozen: 1, Natal Estates Co, Ltd.

Fruits, bottled: 1, Mrs F A Sams.

Lemon juice: 1, P H Campbell; 2, Stantial & Allerston.

Lime juice: 1, J Newson.

Lemon squash: 1, J Newson; 2, Stantial & Allerston.

Cordials and syrups: 1, Hessey Allanson; 2, J Newson; highly commended, Stantial & Allerston.

Best variety aerated waters: 2, Natal Mineral Water Co, Ltd.

Extra exhibits: Certificates of merit, The Trappists, wine; special, Thomas Dawson, brawns, etc.

MANUFACTURES.

Special prize, £5 5s, presented by Mr J Smith, builder, for best 100 plain building bricks: 1, Raisethorpe Brickworks, Ltd; highly commended, Clark and Co.

Collection of furniture made in the colony from colonial woods: 1, J W Reid.

Harness, made in the colony of colonial leather: 1, Lyle Bros; 2 and highly commended, The Trappists.

Harness, made in the colony of colonial leather: 1, Lyle Bros; 2, The Trappists.

Harness, made in the colony: 1, Geo Dalton & Son; 2, R Alcock; highly commended, Lyle Bros.

Harness, set of single, made in the colony: 1, G Dalton & Son; 2, Lyle Bros; highly commended, R Alcock.

Leather, 50 lbs, South African made: 1 and 2, The Trappists.

Silk, best collection, wound by exhibitor: 2, T Licence.

Tobacco, grown in the colony: 1, The Natal Tobacco Plantations, Ltd; 2, Wm Starr.

Tobacco, manufactured, grown in the colony: 1, The Natal Tobacco Plantations, Ltd.

Tobacco, 100 twisted, grown in the colony: 1, The Natal Tobacco Plantations, Ltd.

Cigars, colonial made, from colonial grown tobacco: 1, Wm Starr.

Extra exhibits: 1, G S Armitage, Pietermaritzburg, bricks and tiles; 1, W H Buchanan, Pietermaritzburg, horse shoes; 1, Representative New South Wales Government, specimens of timbers; 2, Lyle Bros, Pietermaritzburg, set of van harness; 2, Lyle Bros, Pietermaritzburg, set four-in-hand mule harness; 2, J W Allison, Pietermaritzburg, set of silver-mounted donkey harness.

APIARIAN SECTION.

Collection of hives and appliances: 1, R H Pepworth.

Most suitable outfit for a beginner: Highly commended, R H Pepworth.

Observatory hive: 1, R H Pepworth; 2, H Green.

Best and most complete frame hive for general use: 1, R H Pepworth.

Twelve sections of comb honey (light), gathered during 1902 or 1903: 1, D C McKenzie; 2, H Green; highly

commended, A N Green; highly commended twice, R H Pepworth.

Twelve sections of comb honey (dark), gathered during 1902 and 1903: 1, D C McKenzie; 2, R H Pepworth.

Twelve shallow frames of comb honey, for extracting: 1, D C McKenzie; 2, H Green.

Twelve jars of run or extracted light coloured honey, gathered during 1902 or 1903: 1, D C McKenzie; 2, R H Pepworth; highly commended, H Green.

Twelve jars of run or extracted dark coloured honey, gross weight to approximate 12 lbs: 1, D C McKenzie; 2, R H Pepworth.

Twelve jars of granulated honey, gathered during 1903, or any previous year: 1, D C McKenzie; commended, H Green.

Best and most attractive display of honey: 1, R H Pepworth; 2, H Green; highly commended, A N Green.

Exhibits of not less than 3 lb of wax: 1, R H Pepworth; 2, D C McKenzie.

Best collection of working bees, honey, and wax: 1, A N Green; 2, R H Pepworth.

IMPLEMENTS.

Agricultural implements, imported, variety of, suited for colonial use: 1, Steel, Murray & Co; 2, P Henwood, Son, Soutter & Co; highly commended, Collins, Kessler & Co; commended, Mason & Broadbent.

Manie drill: Steel, Murray & Co.

Baling press for hay, made in Natal: 2, A Collins.

Wagon, adapted for farm work: 1 and 2, B Ireland & Son.

Engine, suitable for farming purposes, 4 to 8-horse power, portable, semi-portable, or stationary, to be shown in motion: 1, Collins, Kessler & Co; 2, E F Ford; highly commended, E F Ford; commended, A Collins.

Carriage, 4-wheel, made in Natal, suitable for country use: 1, W Vickers and Co; 2, E Bayerstock; highly commended, W Vickers & Co; commended, E F Ford.

Carriage, Landau, or Victoria, or similar vehicle, made in Natal, for town use: 1, 2, and highly commended, W Vickers & Co; commended, G Barfield.

Carriage, phaeton, or similar vehicle, for town use: 1, W Vickers & Co; 2, E Bayerstock; highly commended, E F Ford; commended, W Vickers & Co.

Carriage, 2-wheel, made in Natal, suitable for country use: 1, W Vickers and Co; 2 and highly commended, E F Ford; commended, G Barfield & Co.

Carriage, 2-wheel, made in Natal, for town use: 1, E F Ford; 2, Motor Car-

riage and Cycle Co; highly commended and commended, W Vickers & Co.

Extra exhibits: 1, W Vickers & Co. Pietermaritzburg, "The Firestone side wire rubber tyres for carriages;" 1, R W Hallam, Durban, "Sulky;" 2, A Collins, Pietermaritzburg, firewood splitters for medium length logs designed and made by exhibitor; highly commended, Collins, Kessler & Co, Samson windmill; commended, H Pakeman, Harden Heights, wattle bark packer, designed by exhibitor.

TRADESMEN'S STALLS.

2, Molassine and Co. Ltd; 1, Porritt and Dick; 1, Nels Rust Dairy; 1, Turnbull & Co; 1, W A Butcher; 1, South African Fertilisers' Co; 1, W Cook and Sons; 1, Stantial & Allerton; 1, W Norrish & Co; 1, P Davis & Sons.

SECOND DAY.

A meeting of the committee was held in the morning to consider various details arising out of the previous day's proceedings. They considered the question of the award of the Challenge Cup to his Excellency the Governor, in view of the fact that in the class competition his Excellency got a second prize. The matter was brought forward on a formal protest made to allow of an explanation. It was explained that the class in which his Excellency gained second prize was a pair of horses, and the horse for which he obtained the Challenge Cup was one of the pair which was, in the opinion of the judges, the best horse in the yard. A protest was lodged as to the award of the prize for eight row mealies on cob, and the judge was requested to examine the whole of the exhibits. The result was that he disqualified all but one, on the ground that they were ten row mealies. The only prize awarded was a second to R. H. Oellermann, of New Hanover. There was only one exhibit of bacon for the Prime Minister's second prize, and the conditions required three before the prize could be awarded. The exhibit was of such excellence, however, that the committee decided to award a special prize to the exhibitor, Thomas Dawson, of Maritzburg. A second prize was given to Miss May Herbert for a display of pastry.

In the poultry section Mr. H. Turner, Dargle Road, was awarded a second prize for an exhibit of a pen of guinea fowls. Among dogs the animal which obtained second prize for Gordon setters, was not Sir T. K. Murray's bitch, Helvian Queen, as announced. The animal which gained the second prize had been put into the wrong kennel. In the class

for grade Shorthorn bulls, South African breed, Mr. R. Garland (Mooi River) was awarded a second prize, as recommended. In the class for Shorthorn heifers a judge's error gave the prize to Mr. P. D. Simmons. The owner was Mr. R. Garland. On the recommendation of the judges Mr. A. M. Peters' old English sheep dog "Thewbury Bob," and the same owner's "Lord Thewbury," were each awarded a first prize. Three bull terrier pups exhibited by Mr. J. W. Sparks (Sydenham) were awarded a special prize. In the extra exhibits of produce first prizes were awarded Mr. William Teasdale for an exhibit of potatoes, and Mr. J. H. Hindle for an exhibit of 100th. Kohl Rabbi. Second prizes were given Mr. T. R. Atkinson and Capt. Montgomery, the former for a show of melons and marrows, and the latter for samples of chopped wattle bark. Mr. John Weddell receives a certificate for a collection of fruit and ornamental trees. First class certificates were awarded the Natal Estates Co., Ltd., for a show case of Natal sugar, Mr. H. Brown for a milk float, the manager of the Nel's Rust Dairy for a calf-feeding apparatus and an exhibition of feeding cakes and meals, the representative of the New South Wales Government for specimens of timber, Mr. G. S. Armitage for bricks and tiles, Porritt and Diek for exhibit of grain, etc., Natal Point Development Syndicate for an exhibit of colonial paints, stains, and varnish, Turnbull and Company for a display of colonial meat, Stantial and Allerston for a display of colonial made mineral waters, etc., and Bibby and Sons for cakes. In the harness section a second prize each was given to Lyle Bros., in two cases, and J. W. Allison, both of Maritzburg. In implements A. Collins, of Maritzburg, was awarded second prize for firewood splitters.

The butter making competition lasted until one o'clock, and was patiently watched by a considerable number of visitors, who, as was exactly the case last year, were accommodated with seats in a small gallery round the competitors. Three gentlemen and two ladies competed. Mr. Kemp, of Estcourt, was the successful gentleman, with 92 points, the second prize falling to Mr Lawrence, with 85 points. The other competitor was Mr Blake, who gained 72½ points. In the ladies' competition, the first honours were shared by the two competitors, Mrs Kemp and Miss Nigglesworth, who received 83 points each.

LADIES' JUMPING COMPETITION.

Mr W H Buchanan's Dustdale (Miss Buchanan) 1

Mr P K Francis's Friar (Miss Buchanan) 2
Mr F G Burchell's Sir Rodger (Miss Stirton) 3
Mr K McKenzie's De Wet (Miss Holdgate) 0
Mr W H Buchanan's Ploughboy (Miss Buchanan) 0

DRIVING COMPETITION.

On the conclusion of the jumping competition, the driving competition for gentlemen took place. The first prize went to Dr. Oddin-Taylor with The Jossier, and the second to Mr. W. Gtridge with Marcus.

SATURDAY'S COMPETITIONS.

Child's Pony (13.2 hands or under), to be ridden by child when judged. Riders not to exceed 13 years: 1, R A Logan; 2, W H Buchanan; highly commended, D Robb; commended, Lewis Crart, J Baikie, J G Wales, G S Armitage, G D Alexander, Maurice Logan, J M Hodgson.

Ladies' Driving Competition. Single horse, with two-wheeled vehicle.

Mrs W H Buchanan's Paddy 1
Mrs Parry's Nora Creina 2

Also competed: Mrs W A Anderson, Mrs F B Brown, Mrs Doig, Mrs D Suttie, Mrs G E Oddin-Taylor, Mrs Leader, Mrs Beauchamp Butler, Mrs W J Gallwey, Mrs H Porritt.

Tent Pegging.—There were but six scratchings out of 47 entries for tent pegging, and the skill shown by the majority of the competitors was highly creditable. Mr. W. Burkinsher, a local volunteer, and S.-O.-S.-M. Cousins, 3rd Dragoon Guards, tied, and on the run-off each man drew a smaller peg, with the result that the committee decided to give each man a first prize. The following were the other competitors:—A E Todd, T M Owen, H Shaw, R Turner, Insptr Clark, Natal Police; Sergt.-Major Brown, Natal Police; Sergt Stevens, Natal Police; E W Campbell, C H Stirton, T Symes, H A Campbell, Capt J Doyley, T Wynne, Sergt Hayes, Natal Police, Capt Burrard, A.S.C.; Leon Ross, J R S Clouston, D De Haas, S.-S.-M. Reed, A.S.C.; Lieut A H Watt, Lieut G T Cliff, Lieut H E Berry, Lieut G Herbert, C.-S.-M. Buxton, 3rd D.G.; S.-S.-M. Stewart, 3rd D.G.; S.-S.-M. Bodger, 3rd D.G.; Sergt Walker, 3rd D.G.; Sergt Walters, 3rd D.G.; Sergt Gray, 3rd D.G.; Corpl Watson, 3rd D.G.; Pte Noble, 3rd D.G.; Sergt Murphy, 3rd D.G.; A C Townsend; Lieut Watson, 7th D.G.; W J Gallwey; Sergt Frampton, S.A.C.; Corpl Cochrane, S.A.C.; and Corpl Pukard, S.A.C.

Jumping Competition for Hunters.—
To carry not less than 10st, over two 4-foot hurdles and a water jump.

Mr W H Buchanan's Ploughboy .. 1
Lieut Smith, R.F.A. 2
Mr Geo Leuchars, M.L.A. 3

Also competed: H C Hadow, P D Simmons, F G Burchell, R Halloway, Capt J Doyle, K McKenzie, W H Buchanan, Capt Burrard, A.S.C.; R H Carrington, 8th Bat. R.F.A.; F A Verney, C.V.S.; P K Francis, F K Wade, Sub-Inspr Collyer, Natal Police; Maritzburg Corporation, Lieut.-Col. Thompson, 7th D.G.; Lieut C Shaw, 7th D.G.; Lieut Watson, 7th D.G.; Lieut A Clifton, 7th D.G.; R Matison, E P Robinson, Lieut Dunne, Lieut Oliver, S.A.C.; Geo Leuchars, M.L.A.; W H Buchanan, B Titson, W Keating, Capt G Moe, N P.; G Turnbull, M Jackson, Inspr W J Clarke, Lieut Smith, R.F.A.; Lieut Devitt, R.F.A.

Trotting Match against time.—

Mr D Suttie's Nancy 1
Mr A W Dowsett's Nelly 2

Also ran: R Otto's Lizard, F W Jameson's Midnight, A Speirs's Chuckles, S.S.M. Reed, A.S.C., Maritzburg Corporation's Darkie, A E Clarke's Mabs.

Jumping Competition for ponies 14 hands and under, over two 3ft 6in hurdles and a water jump.—

S T Amos's Clevedon Surprise .. . 1
Lieut Devitt, R.F.A. 2

Also competed: F G Burchell's Crosscut, A G T Wales's Bobadie, W H Buchanan's Paddy, Capt Pigott's Tanglefoot, F K Wade's Flo, Lieut Smart, Lieut Oliver, A.S.C., Spoudulicks, P Vincent's Jerry.

The Nottingham Road Farmers' Association has given a special donation to the funds of the society.

The first prize for mealies, white Hickory King, on cob, was awarded to Mr T R Atkinson, Tweedie Hall, and not to Mr R J Spiers, Dargle, as previously announced.

Mr O Hosking, Rosetta, sold his prize-winning Shorthorn bull privately on Friday, for 200 guineas.

The Peanut for Poultry.

THE peanut is one of the best foods that I have ever fed to poultry (says a writer in the *Texas Stockman*). It far excels maize, wheat, or oats for laying hens as well as for growing chicks.

1. Hens or chicks will not get fat on peanuts as they will on maize or wheat.

2. Hens will lay more eggs and chicks will grow faster than if fed on maize or wheat.

3. They are a health-giving food to all kinds of poultry.

4. They will grow on almost any kind of soil, from the poorest white sand to a sandy clay.

5. They will get ripe farther north than the earliest maize.

6. You can raise more peanuts to a given piece of ground than you can of maize or wheat, and it is not so much work to raise them as it is to raise corn.

7. They are the best feed to throw in scratching shed with tops and all, and hens can be kept busy all day. They will work for them and lay too.

Wherever peanuts (or earthnuts, as they are sometimes called) have been tried in New South Wales successful re-

sults have been reported. They are easily cultivated, and the "nuts," which grow in a cluster underground, can be dug up and stored for a long time without much care, or fowls or pigs can be turned in to root out the crop for themselves. In a season like this it is not too late yet for moderate sowings in friable soil.

Buffalo fighting is a very popular sport in the southern parts of Burma, and round the town of Tavoy buffaloes are trained for the arena in every village. As a general rule the buffalo fight is rather a tame affair, the opposing beasts getting their heads and huge spreading horns locked together and "showing" steadily till one is borne backwards by his foe's superior weight. Each fighting buffalo in the ring is ridden by an active young man, who guides his beast with a cord passing through the hole bored in its nostrils, and urges it to effort with his voice and bare heels. On either side of each buffalo stands a man with flags, whose duty it is to keep the animal face to face with its opponent. Sometimes the buffaloes get their blood up and fight viciously without encouragement; but more often the contest degenerates into a mere matter of pushing, or one gets frightened, turns tail, and lumbers out of the ring at a heavy gallop. The victorious buffalo is led home to his village wreathed with flowers, and accompanied by a band and shouting admirers.

Annual Report of the Director of Agriculture.

THE Annual Report of the Director of Agriculture, a very lengthy document, will shortly be published. In the meantime we call from the advance sheets the following:—

In 1902, the Agricultural Statistics were, for the first time, collected by the Agricultural Department.

The following table shows the quantity and value of the crops produced:—

CROPS PRODUCED IN 1902.

	NATAL PROPER.		ZULULAND,	
	Quantities.	Value.	Quantities	Value.
		£		£
Aloes (fibre), tons	12	18	...	...
Artificial Pastures (cut), tons	10,073½	10,074	...	...
Arrowroot, cwt	685½	1,290	...	...
Bananas ... ..	...	11,010	...	37
Barley, muids	2,535½	2,852	3	2
Beans, muids	10,597½	10,423	67½	76
Buckwheat, muids	605	661	...	...
Cayenne Pepper, lbs.	5,111	196	...	...
Coffee, lbs.	43,778	1,661	...	...
Dombula, muids	1,103½	552	16	8
Green Crops (fodder), tons	18,155½	18,155	40	40
Kafir Corn (sorghum), muids	443,202	423,172	191,950	159,445
Lucerne, tons	641½	6,412	1	10
Maize, muids	1,112,777	828,531	225,965	157,461
Madombi (Colocasia), tons	109,139½	55,992	11,140	5,570
Mangolds, tons	844	844	...	...
Millet, muids... ..	1,744	4,260	...	...
Oats, grain, muids	2,911½	3,520	...	...
Oat, hay, tons	4,483½	48,498	1½	2
Oil nuts, muids	779	467	1½	1
Onions, muids	2,536	3,272	...	...
Orchard fruit .. ..	...	34,901	...	2
Peas, muids	1,232	1,109	13½	12
Pineapples ... ..	...	2,955	...	...
Potatoes, muids	155,261½	113,389	798½	822
Pumpkins, tons	21,371½	196,130	776½	876
Rice, tons	41	18	...	...
Sugar Cane (sugar), cwt.	421,901	344,553	...	...
Sugar Cane (rum), gal... ..	122,795	46,043	...	...
Sweet Potatoes, muids	330,032½	68,977	...	...
Tea, lbs.	1,796,230	52,265	...	...
Tobacco, lbs.	3,409,013	95,440	7,490	3,379
Turnips, tons	12,711½	12,711	...	...
Vegetables ... ..	...	8,474	...	...
Wattle Bark, tons	11,667½	81,669	...	...
Wheat, muids... ..	1,293	1,503	...	...
Other crops ... ..	...	2,077	...	...
Total Values ... ..	...	2,498,019	...	340,795

The above figures do not include timber returns.

Besides the above vegetable products, the statistics show the following output of animal products in Natal proper only :—

ANIMAL PRODUCTS IN 1902.

NATAL PROPER.			
		Quantities.	Values. £
Bacon, lbs. ..	..	389,997	14,625
Butter „ ...	...	533,416	42,229
Cheese „ ...	...	14,116	853
Mohair „ ...	...	108,916	4,292
Ostrich Feathers	...	...	1,359
Tallow, cwt. ...	...	171	552
Wool, lb. ...	..	2,043,160	51,079
Total value	...	...	115,689

The statistics give no returns of hides, milk, or eggs, but some idea as to the production of hides can be obtained from the export returns to be considered later on in the report.

The lands of the Colony carried also the following live stock :—

LIVE STOCK STATISTICS, 1902.

NATAL PROPER.				ZULULAND.	
		Number.	Value. £	Number.	Value. £
Cattle ...	...	401,021	7,045,900	118,656	2,031,393
Donkeys ..	..	1,320	6,560	70	350
Goats (Angora) ...	...	78,274	90,015	176	202
Goats (Kafir) ...	...	413,524	355,867	119,135	178,702
Horses ..	...	63,374	1,153,720	3,321	55,624
Mules ...	...	1,922	38,172	30	720
Ostriches ..	..	1,328	9,960		
Pigs ...	...	47,463	74,535	8,176	9,508
Sheep ...	...	522,850	512,036	39,552	41,957
			9,286,765		2,318,456

The above figures represent the total numbers and value of the live stock carried by the land in 1902, exclusive however of poultry, statistics of which have not hitherto been collected. The figures do not represent the annual production, which would be shown by the live stock brought into consumption during the year. Statistics of these were not collected ; but by an estimate, the details of which need not be given here, it

appears that the value of the annual production of live stock during 1902 would be about as follows :—

Natal Proper	...	...	£1,177,162
Zululand	...	...	231,891
Total	...	...	£1,409,053

The statistics thus represent the agricultural production, all told, of the Colony in 1902 to have been as follows :—

TOTAL AGRICULTURAL PRODUCTS, 1902.

	Natal Proper.	Zululand.	Whole Colony.
	£	£	£
Crops	2,489,019	340,795	2,838,814
Animal Products ..	115,405	...	115,405
Live Stock Brought into Consumption	1,177,162	231,891	1,409,053
Totals	£3,790,586	£572,970	£4,363,552

There was a total production, valued at Natal prices, of £4,363,552 ; or, if the value of timber, hides, milk, eggs and poultry be estimated at £340,000, of £4,700,000 in round numbers.

Is the result satisfactory ? The answer depends upon the point of view from which it is given. If the agricultural development of the country be regarded in the light of the Colony's past history, it is all that could be expected, and satisfactory so far as it goes. But how does it appear when viewed from the standpoint of the country's requirements, and of the possibilities of future development ?

Does the country supply its own agricultural wants ? The answer is given in a table at the end of the report, which contains statistics of the agricultural imports in 1901 and 1902. This table shows that the country imported, exclusive of direct importations of military stores, agricultural products and simple articles manufactured therefrom, as follows :—

VALUE OF AGRICULTURAL IMPORTS.

	1901.	1902.
Total Imports	£5,156,753	£6,468,208
Entered for consumption in Natal ...	2,675,465	3,735,256

These import figures are not based on Natal prices, but are values declared on invoices sent from the ports of shipment, and may in some cases be even below the real values at those ports.

In the estimates already given in the report of the value of Natal live stock, lower average prices were used than those submitted by the collectors of statistics. This was done in order to allow for young animals, and inferior Kafir and Indian live stock. Also in estimating the value of vegetable produce, the Kafir produce has been taken as of somewhat less value than that of the European and Indian. But, notwithstanding these deductions, there is no doubt that the figures already given as to the value of the

Colony's agricultural produce do not give a just basis for comparison with the value of the agricultural imports, and deductions should be made. Thus, if the average value of cattle be taken at £10, sheep at 12s. 9d., maize at 9s. 9½d., fodder at £4 4s. 3d., potatoes at £5 6s. 4d., and sugar at 10s., then, on these items, the estimate of local production would be reduced by the following amounts:—

Cattle	...	...	...	...	£375,350
Sheep	...	...	...	...	48,964
Maize	...	...	...	...	332,146
Fodder	...	...	...	...	29,621
Potatoes	...	...	...	...	58,603
Sugar	...	...	...	...	133,603
Total					£978,351

Thus, on these items alone a deduction of close on one million sterling would have to be made. On the other hand, there is a certain small amount of local agricultural manufacture, such as wagon and cart building, yoke and harness making, tanning, and jam and pickle making, the whole of which would scarcely amount to £50,000. Considering everything, it may be reckoned that in 1902 the lands of Natal produced agricultural wealth to the value of £3,700,000, reckoned at normal prices: and that, in order to fully supply the agricultural needs of the Colony, further products to the value of £3,735,256 had to be imported.

If it be the fact that Natal is exporting its £3,700,000 worth of agricultural produce at high prices and is importing £3,735,256 worth at low prices, thus making an advantageous bargain, the position is satisfactory.

The following figures summarise the agricultural imports and exports of Natal for the years 1901-02:—

SUMMARY OF AGRICULTURAL IMPORTS AND EXPORTS, 1901 AND 1902.

	1901.			1902.		
	IMPORTS.		EXPORTS	IMPORTS.		EXPORTS.
	Total	For Consumption in Natal.	Natal Produce.	Total.	For Consumption in Natal.	Natal Produce.
	£	£	£	£	£	£
Foodstuffs, Animal	1,860,699	628,040	717	2,176,706	1,233,602	40
Do, Vegetable	1,660,025	713,562	182,565	1,337,501	688,438	244,434
Liquors and Tobacco	665,140	237,209	53,878	773,616	267,585	26,976
Timber, Bark, &c.	289,912	231,126	70,088	455,786	324,904	74,903
Live Stock	70,403	69,595	3,762	326,190	319,601	1,937
Leather, Hides and Leather Goods	451,496	348,161	67,478	550,917	367,281	36,365
Textiles and Simple Manufactures thereof	184,936	158,295	266,022	300,974	217,422	272,898
Agricultural Chemicals, Oils, Soap	388,551	207,297	6,021	409,691	206,769	6,277
Tools and Implements	85,591	82,180	2,172	136,827	109,654	1,990
Totals	5,156,753	2,675,465	652,265	6,468,208	3,735,256	665,820

The agricultural imports in 1902 showed increases over those in 1901 all down the line, except in vegetable foodstuffs, which showed a slight decrease. The chief increase was in animal foodstuffs, which, for local consumption, were £628,040 in 1901 and

£1,233,602 in 1902. Next to this the chief increases were in live stock (cattle, horses and sheep), and in timber.

The chief agricultural exports were as follows :—

	1901. £	1902. £
Wool	253,935	247,152
Sugar	113,369	162,717
Bark	69,850	74,554
Hides and Skins	65,902	55,342
Maize	36,030	33,231
Fruit and Jam	12,975	21,686
Tea	15,415	16,928
Tobacco	38,991	13,333

From the above statement it will be seen that the exports of Natal agricultural produce amounted in value to £652,265 in 1901 and £665,820 in 1902. The total exports of Natal produce, including minerals and all else, in 1902 were :—

TOTAL EXPORTS OF NATAL PRODUCTS IN 1902.

Agricultural Produce	£665,820
Minerals, etc.	810,780
Total	£1,476,600

The total imports for Natal consumption during the same period were :—

TOTAL IMPORTS FOR NATAL CONSUMPTION IN 1902.

Agricultural Imports	£3,735,256
Other Imports (not counting £1,079,768 railway material other than sleepers)...	3,793,157
Total	£7,528,413

These imports are paid for not only by the country's agriculture but also by its mining industry, to a great extent by its commerce, by the profits on capital invested in the interior Colonies, and otherwise. The extent of the commercial operations with the interior Colonies is shewn by the fact that in 1902, the value of the goods passed through the country was £7,679,768. The amount of the agricultural imports is such as to show clearly that there is still a good local market for local agricultural enterprise.

(To be continued).

Correspondence.

To the Editor Agricultural Journal.

REGULATIONS FOR IMPORT OF FRUIT TREES.

SIR,—I have read, with much interest, Mr. Claude Fuller's criticism of Mr. F. E. Weaver's comments on the uselessness, etc., of our Laws for promoting the introduction only of clean specimens of plants and trees into the Colonies. Mr. Fuller has dealt with these strictures in an able and commonsense manner, and I would also ask Mr. Weaver, referring to his two articles in your last issue, if

he thinks that Natal farmers are "made of money," that they can afford to import all the valuable seeds, etc., which he recommends, and to plant such large areas of that "ridgy country" which his second letter alludes to?

I think the time is far distant when Natal farmers will combine to plant trees. Farmers, as a rule, fear competition less than those in most other occupations, yet it seems to me that A would naturally say, "Well, the fewer trees B plants the better the market will be for

SUFFOLK MARE.



First Prize, Royal Show, England. 1902.

EXHIBITED BY MR CUTHBERT QUILTER. IPSWICH.

By the Courtesy of Messrs. Wm. Cooper and Nephews.

mine." Moreover, does Mr. Weaver understand that tree planting is an expensive process—with a long period to wait for returns? Fencing, cultivation, protection from fire, are only a few of the requisites for successful tree planting. I agree with Mr. Weaver that much land and labour have been wasted in planting, or, rather, allowing to grow a vast amount of useless rubbish, but I think Mr. Weaver does not understand that until lately our Native servants have been allowed to be the judges in the matter of self-sown shrubs, trees, etc., hence the mass of useless blue gums, syringas, mulberries, willows, loquats, et hoc, that cumber the ground. However, doubtless the farmers in Natal are now awake to the desirability of propagating good and useful timber and fruit trees, but, where is the reliable labour?

Our ridgy country is not an American prairie, where a man inspans his team and ploughs a furrow so long, that he goes "up one day and back the next." It is *very* "ridgy," and very slow work at that, in Natal anyway. It is to be hoped that our up-to-date Australian and American "advisers" will *themselves* tackle a piece of land in Natal or the Cape Colony, keep silence for a year or two, and *then* give us some further advice.

If Mr. Weaver could furnish us with 10 or 12 inches more of rain I have no doubt but that the farmers of Natal would "hustle" and get a large area of land into cultivation "next spring," but I fear many of them will be compelled to say: "Corn and potato cultivation must take the precedence, and when favourable seasons and the labour market permit, tree planting. This shall also be attended to." The Government experimental farm appears to have done wonderfully well, considering the "season." I would like to pay it a visit, but it seems almost cruel to inspect any farm after a twelve months' drought.—I am, Sir, yours, etc.,

WM. LISTER.

Bad y-ruel, Zwartkop Valley.

SOUTH AFRICAN RINDERPEST.

The following letter appears in the *Veterinary Record*, 4th April, 1903:—

Away in seclusion a December, 1902, *Journal of Comparative Pathology* comes to hand. It tells an old story—South African Rinderpest—much as fashion decrees cattle diseases shall be recorded. Histories written to-day of a disease that rampaged five years ago are valuable—a readable book might well be written on vital points yet unconsidered! Has it yet dawned on the thinking men of the profession that the presence of Koch directing veterinary matters in South Africa can only be explained by timidity and lack of enterprise on the part of the British veterinary profession? The Colonies demand *results*. We offered stamping out. It failed. England pushed 1865 methods, Germany offered 1896 goods, and got the job. (Hold hard! one solitary exception, Watkins-Pitchford always fought for and applied modern work.) Of what use is new knowledge bound in by steel-ribbed reverence for old ways? British lack of initiative lost the profession supreme direction of the mightiest system of inoculation yet carried out. We have in our ranks a man whose training and clear insight into pathological processes fit him for directing an experimental rinderpest station such as Koch had. He is, further, in close touch with the powers who dwell in the hub of the British Empire. What ailed him that he did not seize control and reap for himself and his profession success? Simply he was dead slow and did not recognise his possibilities. Thus we stagnate!

Koch follows the rule. He blurted out a false theory—all askew with the law of immunity. The Colonial, knowing facts, quietly buried Koch's reputation, then went his way seeking and demanding *results*. Fortunately the veterinarian in the veld was well enough balanced to discard the theory of the research camp. Inoculation was successfully applied according to the law of immunity, but in total disregard of any one man's teaching. If praise must be awarded any one individual it is due Watkins-

Pitchford, for he had done sound work before the foreign medical men appeared. Yet the truth remains that inoculation has been evolved by united effort.

We live in 1903 and not in 1865. Let the profession lay hold with both hands to its own affairs, push the laboratory trained veterinarian into the positions that should be his—fire out the foreign crowd. The profession has to so advertise itself that when the Colonies want a laboratory man they will instinctively turn to *us*—and not to Berlin. We must show them that we are able to offer them the *best* in our line. This *plus* a little “wire pulling” will secure the head positions, and once there nothing bars the road to success but British pessimism, which the wise Britisher will promptly swap for Colonial optimism.—Yours truly,

W. STAPLEY, M.R.C.V.S.

San Dimas, California, U.S.A.,

March 10th, 1903.

REDWATER INOCULATION.

DEAR SIR,—I read with some interest Mr. Louis D. Gilson's letter in the *Journal* on inoculation for redwater. I cannot say that I agree with him. I think he must have it in a very mild form, as I find from experience that it not only needs treating without delay, but requires medicine which also acts promptly. Perhaps Mr. Gilson is not aware that there are two forms of this disease; the one almost always fatal, which occurs during the hot summer months, and the other prolonged and less fatal, occurring during the colder weather in autumn.

We all know that prevention is better than cure, but seeing one cannot regard a beast as safe until it has had the disease in a virulent form, where does inoculation come in? For instance, say he takes those animals from the bush veld he speaks of to another grazing place say ten miles away, they would almost of a certainty readily take redwater again. If this is the case, what does one gain? The same thing is star-

ing him in the face: more beasts elsewhere, and they are liable to contract the disease again. Even our safe or salted cattle take it sometimes, which proves that all cattle cannot be safely migrated during certain seasons of the year.

Another point is, can one be perfectly sure the animal is free from other diseases? For instance, supposing the animal Mr. Gilson used blood from was suffering from tuberculosis, what would be the result?

Mr. Watkins-Pitchford's comments are good, and I can vouch for the reactions he speaks of. I have seen a number of cattle inoculated, and in the end have had to fall back on medicine. The age of the animals has also a lot to do with it; I have always less trouble and am more sure of success when dosing young animals. I have dosed 59 head this season, 17 for redwater and 12 for gallsickness; of these 9 have died, and those which recovered have been sent back to where they contracted the disease. I hold that if owners watch their cattle carefully and dose them in time, better results cannot be wished for. If anyone wishes to try my receipt for redwater I shall be pleased to forward same. I may add that it seems a deadly dose, but I hold to a good dose and good results.

ARTHUR M. ADEY.

Sneczewood, East Griqualand.

TOBACCO AT ESHOWE.

DEAR SIR,—In view of the severe drought which has prevailed all over this part of South Africa of late, it might, I venture to think, be of interest to you and your readers to have a short account of my endeavour to establish for my own ends one of the finest types of American tobacco. Maryland tobacco is usually considered, both in Holland and America, to possess the qualities of an ideal pipe-smoking tobacco above all others, and my object has been to acclimatise it here without any cross fertilization. I was encouraged by the result of my second essay, viz., the growth of a few plants in my garden

here. My first attempt at raising seed in 1896 was a blank failure at New Scotland, Pietermaritzburg. I made my third attempt in an old gaol garden here, with seed raised in my second (successful) trial in the garden, and there in the third attempt saved a couple of hundred plants out of twelve hundred planted, the difference having all failed through the usual tobacco pests and insufficient knowledge of the work. Leaves on plants on this plantation occasionally attained a length of 30 inches and width of 17 inches. This year, however, I raised with seed from the above (gaol) ground eighteen beds of plants, from which I planted out on entirely new and virgin ground, in extent 2 acres, 15,000 plants. Nearly all have survived the drought and all other pests, and though growing between five and seven months are nevertheless now fit to harvest. In a few hundred cases they have attained full development, though the majority are not tall plants, yet perfectly healthy in all other respects. I am sending you the dimensions of a specimen plant. This will show, by the aid of photographs, also being sent, the enormous development to which this plant can attain, far exceeding that in the previous crop in the gaol garden here (last year's attempt). I have used no kraal manure whatever, only applying chemical fertilisers, such as "dried blood," "nitrate of potash," "superphosphate," and "lime," in due proportions, after having obtained comparative analyses of my own soil and that of the great district in America where the "White Burley" tobacco is grown, so that as far as possible the same plant food should be in my land, and it was tilled also in the same manner in the White Burley district.

I must, in conclusion, apologise for the length of this letter, but I have been urged by a highly-placed official here to communicate the above. I may also say that, thanks to the late tobacco expert, M. van Leenhoff, with whom I stayed and studied at the Umvohumbi Valley, and also to the kind courtesy extended to me by the neighbouring residents there, at one of whose houses I stayed,

I not only laid in a valuable stock of knowledge of tobacco culture, but was also enabled, from a plan given me by the expert, to construct my curing shed, which is scientifically made on principles of ventilation, is provided with three rows of ventilators, and two double gable end doors. It is 36 feet by 18 feet wide, 17½ feet high, and has a thatched roof, and answers its purpose thoroughly.

My object is to manufacture the tobacco here as cut and bagged tobacco; I shall import my machine from England.

I may mention incidentally that last year I had no difficulty in selling my small crop at 4s. a lb., though the soil had not been properly manured as it has been this year—I am, yours truly,

L. B. DENMAN.

Commander, R.N.

St. Helier's, Eshowe.

RICHARDSONIA PILOSA.

A TROUBLESOME WEED.

SIR,—It might be of interest to the farming community, in other parts of the Colony, to know something of the above weed, and I accordingly forward you a specimen of the plant in a small box for the information of the Minister of Agriculture.

This weed, from the information I can glean, is spreading rapidly on the Coast lands and in Native locations; so much so that its advent on the land makes the soil sterile and worthless, not even a common sweet potato will grow on the land. It becomes thoroughly permeated with the roots, and the more the land is ploughed with the object of eradication the more it seems to spread.

In some parts about here and Pinetown many acres are totally lying waste. I was told by a German farmer here that hundreds of acres near Pinetown are absolutely useless. A small quantity has just shown itself on my land, but I have had it removed by the roots. Once it flowers the seed is wafted by the winds far and wide, and its spread is rapid over the whole area of ploughed land. The

seed, from what I can gather, is carried by the winds from the public roads of the Colony, where there is a plentiful crop, I understand. The Natives tell me that the location gardens are full of it, and they call it "masimba ezinkumbi" (the excreta of the locust). They say it was brought by the locusts to this Colony and deposited in the excreta. This may or may not be so, as the Natives are very superstitious in matters of this kind. I cannot give the exact botanical name of the plant, and, therefore, cannot say whether it is a native of Northern or Eastern Africa, or an exotic. Of course, if the latter, then the idea of its introduction by the locusts is at once exploded.

Although I have resided in the Colony all my life, more or less, the plant has not hitherto come under my notice to any extent: but if the Natives, who are pretty keen observers, are to be believed, they say it came to the Colony about six years ago, when the locusts came to Natal, and the German farmers about here have also told me that the weed is a new comer to the Colony. Others may know more about it than I do, but, in conclusion, all wish it to be known that it measures are not taken with the object of its entire eradication, before many years pass thousands of acres of otherwise fertile land will be no good either for grazing or agriculture. If there is any doubt in what I have written, let a few experts obtain ocular demonstration.—Yours, etc.,

W. R. GORDON.

Stockville, May 30th, 1903.

Description by J. MEDLEY WOOD, A.L.S.

On the weed being sent to Mr. J. Medley Wood for identification, he replied that it was *Richardsonia pilosa*, H.B. & K., and gave the following extract from Vol. IV., *Natal Plants* already completed, and ready for publication:—

A troublesome weed. Originally a native of tropical America, it has gradually spread in other tropical and sub-tropical countries, and was most likely introduced into Natal about the time of the Zulu war, and since then it has spread almost all over the Colony

In the *Flora of Tropical Africa*, published in 1877, it is described under the name of *Richardia scabra*, but the name *Richardia* being pre-occupied by a genus of Aroideae, the name was altered to *Richardsonia scabra*, but according to the *Genera Plantarum* its proper name is as given above. Baron Mueller says of it:—"From Mexico to Brazil. As an herb for pastures and hay crop, appreciated in localities with sandy soil. It has spread over the Southern States of North America."

In Natal it is not generally known as a pasture plant, but it is a very great nuisance on lawns, and is very difficult to eradicate when once it has obtained a footing, as it has long roots and bears seeds in abundance. I am informed by Mr. R. Beningsfield that not only cattle and horses, but also rabbits and fowls, are extremely fond of it. Whether it would yield a heavy crop or not is somewhat doubtful. The roots are emetic, and have been used at Home under the name of "White Ipecacuanha," but have now been superseded by the true drug. I first collected it in 1883.

Memo. re *Richardsonia pilosa*.

This weed not only spreads by its abundant seed, but also persists by means of its deep and spreading roots.

Weeds of this kind can be killed by repeated spraying with arsenic and soda solution, or strong blue stone, and, when in small patches only, by heavy dressings of salt. It has been found practicable also to destroy such weeds over large areas by constant cultivation with a skimmer or other cutting implement, which cuts the plants about an inch or two below the surface of the soil. The roots send up new shoots, but owing to constant cutting these are never allowed to develop, and the roots at last exhaust themselves through constantly sending up young shoots. It may take three years to entirely clear land in this way: the first year has to be one of bare fallow, but in the second and third years hoed crops may be grown.

A. N. PEARSON,

Director of Agriculture.

13th June, 1903.

Veterinary Departmental Report for April, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of April, 1903 :—

Scab.—Twenty-two fresh outbreaks of this disease have occurred during the month throughout the Colony.

Lungsickness.—Sixteen outbreaks of this disease have occurred during the month—2 Newcastle, 1 Umsinga, 1 Klip River, 1 Estcourt, 5 Vryheid, and 6 in Zululand.

Rinderpest.—Two separate outbreaks of this disease occurred in the Estcourt Division. The one on Mr. J. W. Moor's farm, Rossendale, appears to have been in existence some considerable time before being reported. There is no direct evidence as to the source of infection in this case. The infection in the second outbreak on the farm Bursea appears to have come from the cattle on the farm Rossendale. Both outbreaks appear to be of a mild character, as far as actual mortality is concerned. This was also the case in the outbreak which occurred at Ennersdale last year, and probably the original source of infection has been the same in both cases. In Krantzkop District another fresh outbreak has occurred in the vicinity of the Tugela. As the disease exists on the other side of the river, in Zululand, this is not surprising. In Zululand there is a marked improvement, as will be seen by D.V.S. Tyler's report. There has been no extension of the disease in the new territories.

Redwater.—Twelve deaths have been reported during the month. The number of cases of Gallsickness reported have shown an increase.

Anthrax.—Six deaths have occurred during the month—1 in Zululand and 5 in Klip River County.

Glanders.—The number of animals destroyed for this disease during the month shows a decrease as compared with last month. Eight clinical cases

have been destroyed, and six which reacted to mallein.

Horsesickness.—There has been a considerable decrease in the number of deaths as compared with last month. Forty-four deaths have been reported. Nineteen of these occurred in Pietermaritzburg District.

I put up herewith reports of the D.V. Sur cons and Stock Inspectors.

S. B. WOOLLATT.

P.V. Surgeon.

May, 1903.

MOOI RIVER.—D.V.S. VERNEY.

Rinderpest.—During this month no less than two different outbreaks of this disease has occurred in my District—one at Mr. J. W. Moor's farm, near Hlatikulu, the other at the farm Bursea, the property of Mr. Comins. The outbreak is somewhat remarkable, inasmuch as there is no other Rinderpest within 80 miles of these farms. The herd that first showed the disease was one of 79 animals, mostly yearlings, the property of Mr. J. W. Moor. Half of these animals were through the Rinderpest that occurred in July last at Ennersdale, and with the absence of any other Rinderpest in the County I cannot help thinking that these animals have had something to do with the disease cropping up in such an unexpected manner. I presume it is quite within the bounds of possibility that one of the recovered Ennersdale animals (and there are several that had recovered in this herd) may have had some intestinal lesion that had never completely healed or had become encapsuled only to break down and so lay the seeds of infection. Of all the Ennersdale cattle in this herd only two animals showed Rinderpest, and these two in a very mild form. What also strengthens this supposition, I think, is the fact that the Rinderpest was of an

extremely modified form to commence with. Forty animals have been sick, and only seven died without treatment. Unfortunately this outbreak was in existence for several weeks before it was detected by me, and largely through this Mr. Groom's cattle contracted the disease, and Mr. Comins not knowing Rinderpest was amongst Mr. Moor's cattle, unfortunately for him took some of his cattle that were grazing near the diseased herd down to his other farm Bursea, and it was in this way the disease got there. A rather remarkable occurrence about the Bursea outbreak is that Mr. Comins did not notice any animals sick until a month had elapsed from the removal of the cattle at Hlatikulu. I cannot help thinking that some animals had been sick before this, but in such a mild form as to be almost beyond detection, unless under very careful observation. Some animals in this Rinderpest hardly show any symptoms except high temperatures and dullness and sore mouths, on the other hand some animals show characteristic Rinderpest. This is especially the case in the Bursea cattle, which, unfortunately, are showing Rinderpest in a more acute form. In going through the sick cattle one cannot help being struck with the fact that yearlings appear to be far more susceptible to the disease than older cattle.

GREYTOWN.—D.V.S. CORDY.

Rinderpest.—I regret to say that when everything pointed to this disease having been stamped out, a fresh outbreak has occurred in the quarantine area, Krantz-kop Division. Twelve head have died out of about thirty cases. It is impossible to say for certain that the disease has been re-introduced from Zululand, but as it was prevalent on the opposite side of the Tugela, and no cases had occurred on the Krantz-kop side for over six weeks, there is strong reason for suspecting that country of supplying the necessary cause of this further trouble. Until the disease has abated on the north side of the river it will always remain a source of danger to the Krantz-kop District. The inoculator sent across to bile cattle reports having done over

four hundred, and as he is continuing with that work the disease should soon be checked in that locality. In the absence of compulsory inoculation it becomes more and more difficult to deal satisfactorily with an outbreak in a location during the winter months, as the pools of drinking water become less in number and the animals are brought more in contact with one another when seeking for water. A conviction was obtained against a farmer in this District for inoculating cattle with bile outside the quarantine area without having obtained permission to do so. As every facility was given during the outbreak of last year, in the same District, for the owners of cattle on farms immediately adjoining the seat of disease to inoculate their troops, I consider the action taken in this case was very uncalled for, and the fine inflicted highly merited.

Horsesickness.—A very few cases of this disease were reported during the month.

DURBAN.—D.V.S. AMOS.

I have the honour to report as follows:—

The importations through Durban are—

Oxen	2,133
Wethers	1,396
Ewes	770
Pigs	38
Mules	31
Horses	33
Donkeys	20
Cows	19
Dogs	17
Bulls	6
Calves	4

Total 4,770

Of the oxen 1,796 came from Madagascar for slaughter and trek purposes, the remainder came from America and were for slaughter purposes. The wethers and ewes were all cross bred from America for slaughter purposes. The 38 pigs came from Madagascar. All the mules came from America. Of the horses, 20 came from America, 12 from England, and 1 from India. The

donkeys came from America, as did the cows, bulls, and calves.

Horsesickness is on the decrease. This month nine deaths only have come to my notice, compared with 66 of last month. One interesting fact is reported to me that over 250 donkeys recently landed have died in the neighbourhood of Congella from a disease similar to Bluetongue. I regret, however, that none of these cases have been brought to my notice before.

Tuberculosis.—Twenty-five animals have been tested, and no reactions obtained. I note your instructions *re* inspection of shipments from Argentina in the outer anchorage. The recent outbreak at Capetown is another proof to my mind of the absolute necessity of landing all stock into a compound at the Port for a period of observation, and proves that a careful ship inspection is not all that is required to prevent the incoming of contagious diseases to a country. A special wharf with a compound and slaughter place attached is required before the system of dealing with stock at the Port is any real safeguard to the Colony.

NEWCASTLE.—D.V.S. HUTCHINSON.

Gallsickness.—The Stock Inspector reports eight animals to have died in Newcastle Division.

Glanders.—Three outbreaks have been dealt with, special reports on these cases having been forwarded to you. I have had to destroy four clinical cases, and a farmer destroyed two other animals said to have been suffering from the disease, which was, no doubt, correct, as they were found to be in contact with two of the clinical cases destroyed by me.

Horsesickness.—Three cases are reported from Utrecht among the N.B.P. horses, and sixteen in Newcastle Division. Personally, I have only met with one case during the season. In several instances I have been called in to attend supposed cases, but they have proved to be something else. With regard to the disease in this part of the Colony, I consider the death rate to have been the lowest experienced for several years past.

On endeavouring to arrive at the approximate number of deaths from this disease, due consideration must be given to the fact that whenever animals show symptoms of lung or bowel trouble the cause is generally attributed either to Horsesickness or Bots.

IXOPO.—D.V.S. POWER.

Quarter-civil.—An outbreak of this disease occurred during the month amongst Mr. Thos. Foster's cattle at Stainton, causing the death of eight well-bred calves. I inoculated the remaining with vaccine supplied by the Government Bacteriologist, and am glad to say there was not another case from that date.

Redwater.—Very few cases of this disease occurred during the month. Through the courtesy of Mr. A. H. Walker I have had an opportunity of witnessing the practical working of his newly-erected dipping tank at Highflats, and saw about 200 head of cattle go through, also about 100 horses of all ages. Both horses and cattle were put through without the slightest hitch, and with ordinary care there seems no liability to accident. Mr. Walker has dipped all his own cattle, and at a very reasonable figure has dipped most of his neighbours' cattle also. I noticed that even with the drop into the tank a beast occasionally escaped without his head being properly immersed, and just now on looking through the last number of the *Agricultural Journal* I see mentioned that a Native be employed to shove the heads of the animals below the surface as they swim by, but from what I saw at Mr. Walker's I do not think that that would work satisfactorily, as it is a very difficult matter to shove a trek ox's head down when he is swimming, as was experienced at Highflats when a forked stick was tried for that purpose. Mr. Walker's idea for this, I think, is a better one; that is, to have a hose pipe arranged so that it could be turned on quickly on any beast that might be escaping without its head going properly under. Owing to the ears being so thickly infested with ticks it is

important that the head should be thoroughly dipped.

MARITZBURG.—D.V.S. FYRTH.

Scab.—Nil.

Lungsickness.—Nil.

Glanders.—Nil.

Horsesickness.—During the month the number of deaths in the City has been 18; in the Umgeni I have only heard of four deaths. In the Upper Umkomanzi Division 13 deaths have been reported.

ESHOWE.—D.V.S. TYLER.

Rinderpest.—The rigid quarantine which has been maintained in the District most affected has had a decidedly good effect. In the Nkandhla District, which was the District chiefly involved on the date of my last report, the disease is now confined to about four kraals. In the Lower Umfolozi District Rinderpest has undergone a gradual extension, as it is only within the last week that I have been able to obtain a European to do duty in the unhealthy part of the country. In the Umlalazi District the disease is dying out fast, and the same holds good for the Eshowe District, though in the latter cattle seem to be moved about by the Natives and others to a much greater degree than in the remaining districts, and so we get more isolated or adventitious outbreaks. Melmoth and Hlabisa Districts are now quite clean, so far as Rinderpest is concerned, and so is Nqutu. In the Mahlabatini and Ndwandwe Districts there is but one kraal affected, and though there might be another outbreak at any time, I think we may consider the disease practically at an end in each situation.

Lungsickness.—During April eight fresh licenses have been issued, and one renewed.

Horsesickness.—Very few cases of this disease have come to my notice, and so far as Zululand is concerned this has been a very mild year up to the present.

General.—All things considered Zululand is in an infinitely more satisfactory condition now, as regards diseases of stock, than it has been for some time

past, and it is a pity that we have not power to compel compulsory inoculation of cattle in contact with independent herds, as I should then have been able to present to you a clean bill of health as far as Rinderpest was concerned, some time ago. If, however, this power is acquired through Parliament, I trust it will be left to the discretion of the local officials to define what are, and what are not *in-contact* cattle, as if any hard and fast line is drawn it will discount, to a great degree, the value that such a measure would otherwise possess.

LADYSMITH.—D.V.S. O'NEIL.

Debility.—I have the honour to inform you that I visited the Acton Homes District at the commencement of this month and inspected a number of cattle that were suffering from a nervous affection which exhibits itself amongst milch cows with calves at foot. This disease is due to excessive drain on the animal system, and you see it especially in cows that are suckling big, strong, healthy calves. It exists on some farms more than others, where there must be a deficiency of lime and phosphate. In treating this disease it is essentially necessary to wean the calf and supply the mother with plenty of food night and morning, in which there is some tonic and condition powders. It is a pitiable sight to see the unfortunate cows in such a condition, some creeping along on their knees, and in the majority of cases they find it difficult to rise from the ground, and when they do they walk along with arch back and tottering gait, and present a picture of extreme emaciation and debility.

Rinderpest has been eradicated from the District, and I have only to report one Native being arrested by one of the Native Rinderpest Police Guard for crossing the Tugela without a permit; he was dealt with by the Resident Magistrate in the usual manner.

Gallsickness has been rife in the Umsinga District owing to the recent rains, and about thirty cases are reported to have succumbed. Two cases occurred:

the Klip River Division which received my prompt attention, and recovered.

Redwater has occurred amongst some stock in the Acton Homes Division, and four have died.

Anthrax has carried off about four or five.

Horsesickness has been responsible for the loss of nine animals during the month.

Mange. This District is practically free from this disease, and during my inspection at Umsinga only two mild cases came under my notice.

HOWICK. -D.V.S. WEBB.

Contagious Diseases. - The Lion's River and Impendile Districts are, as far as I am aware, free from contagious diseases, with the exception of Scab in sheep. The principal cases treated during the month were:—Impaction of the stomach in a stallion, which ultimately developed into mad staggers. The horse had to be shot.

Valuable polo pony bitten on the fore-arm by a snake: the swelling was tremendous. The pony has, I believe, completely recovered.

Ox with impaction of the first and second stomachs. This animal was too far gone for treatment to be of any avail when I saw it. Owner decided to shoot the ox. The *post-mortem* examination revealed the presence of a hair-ball blocking up the passage between the second and third stomachs.

Two cows and one trek ox with abomasitis, or grass staggers; these cases were all in an advanced stage of the disease; I expect they all succumbed.

Abomasitis, or Grass Staggers, seems a common disease amongst cattle at this season, and is probably caused by the large percentage of indigestible fibre in the grass, together with the seeds found at this time of year; it is also probable that some of the grasses are actually poisonous at this period of their growth, such is known to be the case with rye grass and *paspalum scrobiculatum* at certain seasons; the disease caused by the latter grass is known in India as kodru poisoning. Attention was, I believe, called to this grass some years back

in the *Agricultural Journal*. Mr. Medley Wood says: "The grass has a wide distribution in Natal, but is not usually found in large quantities." It is quite possible this grass, together with other Natal grasses which may possess similar peculiar properties, will account for so many cases of Grass Staggers, also often put down as vegetable poisoning. The principal symptoms of Grass Staggers are dulness, loss of appetite, impaired vision, animals affected will often walk straight into the kraal wall or a wire fence without apparently seeing it, at times boring the head into some solid object, at others wandering aimlessly about, after a while they stagger in their walk and ultimately go down and become unable to rise; when down the head is kept persistently to one side. The bowels are generally constipated. Treatment to be successful must be commenced during the early stage of the disease, and then I consider the removal of from 1 to 6 quarts of blood from the jugular vein is of great advantage in relieving the brain symptoms, and it may perhaps also remove some of the poisonous material from the system. A stiff purgative should be given, such as—

Epsom salts . . . 2 lbs.

Calomel 1 to 2 drams.

Ginger 2 ozs.

These doses are for full grown cattle. An hour or so after administering the purgative give a drench made up of

Carbonate of ammonia . . . 2 drams.

Nux vomica 1 dram.

powdered and mixed with a quart of linseed gruel. This drench may be given with advantage two or three times daily at regular intervals, according to the severity of the attack, and until the bowels are freely open.

Warm enemata of soap and water are also helpful and may be administered with an ordinary garden syringe well greased before use. Animals, whilst under treatment should be kept dry and warm.

Hypodermic injections of physostigmine or strychnine are in many cases from the promptness of their action indicated, but unless used with due discretion and knowledge of their action had better be left alone.

Although called Abomasitis or Inflammation of the True Stomach, the inflammatory process is not present, in my opinion, at the initial stage, but develops as a result of the poisonous material being passed on to it from the other stomachs, thus the necessity for removing as much of the ingesta as quickly as possible with a prompt and powerful purgative. If the disease is left too long and until inflammation of the true stomach has had time to establish itself such heroic treatment as previously advised would be out of the question: as a matter of fact, if the disease is not promptly attended any treatment is almost hopeless.

VERULAM.—D.V.S. SHARPE.

Scab.—There are five flocks under license in Alfred County and three in Indwedwe Division: they are all among Native sheep and goats, and are all slight.

Lungsickness.—None.

Glanders.—I have shot two horses showing clinical symptoms, and tested four in-contact ones, two of which reacted. In each case the *post-mortem* examination revealed Glanders.

Rinderpest.—None. There is still a guard on the Tugela. The river most of the month has been very low. These guards have on several occasions stopped

Natives bringing meat, hides, etc., across from an infected area.

Horsesickness.—This disease seems mostly over now, only five deaths during the month having been reported to me.

General.—Stock continue very healthy. During the month eight deaths from Quarter-evil and four from Gallsickness have occurred.

VRVHEID.—D.V.S. CROLE.

Rinderpest still maintains its hold in both Districts, though as yet it has not spread beyond the proclaimed areas.

Lungsickness is very prevalent, especially in the Tabankulu District. Several cases of attempted evasion of the requirements of the law have occurred.

Redwater.—No case has been brought to my notice.

Horsesickness.—Two cases have come to my knowledge.

Glanders.—Several cases have occurred here, and several in-contact animals have proved on testing to have also been affected. I fear it will take some time to eradicate this scourge.

Equine Mange is fairly prevalent.

Scab.—No case has been reported. There are, to all intents and purposes, no sheep in these Districts. An important French company proposes to import six shiploads here shortly.

The Rhodesian Disease has approached no nearer our border.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of May, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903, May, 1	Grapes	59 boxes	Cape Town	Walmer Castle	Free of Pest.
" "	Apples	25 "	"	"	" "
" "	Bulbs and Ornamental Plants	4 cases	London	"	" "
" 5	Trees and Plants, Ornamental. Various consignees	11 "	"	Newark Castle	" "
" 7	Apples	1,875 boxes	Albany	Moravian	" "
" "	Plants, Ornamental ...	6 cases	"	"	" "
" "	Potatoes	875 "	"	"	" "
" 14	Apples	25 "	New Zealand	Surrey	" "
" "	"	37 "	Cape Colony	Briton	" "
" 16	Potatoes	500 "	London	Ingeli	" "
" 21	"	1,240 bags	Hamburg	Reichstag	" "
" 27	"	168 baskets 50 cases	Austria	Africa	" "

Custom House, Durban, 4th June, 1903.

C. B. JONES, Examining Officer.

Natal Sugar Cane in Antigua.

THE Rev. W. A. Goodwin has kindly forwarded to the Director of Agriculture a copy of the *Antigua Standard*, 2nd May, 1903, containing the following:—

In response to our request to be favoured with information as to the results of several specimens of canes imported from Natal a couple of years ago, we are courteously placed in possession of what will be read with interest by our planter friends. Mr. George J. Goodwin, of Deurs, under date 27th April, writes:—

In reference to African canes reaped by me this year, I herewith give you all figures at my disposal. The "Uba" I had abandoned altogether since last year, as it was such a small, hard, dry cane, which would not let go its trash, it cost too much to cut, and was then far below our present standard canes. The "Green Natal," which is a ribbon cane, very much like our "red ribbon," I find to be a good cane with excellent juice, and giving as much weight of good, stout, juicy cane as the "Mount Blanc" and "W. Transparent." I had planted in the same field. I found that four rows of 225 ft. each, equalling 4,500 ft., gave me 312 galls. juice, which would total about 3,020 galls. to acre, and at a yield of 1,360 galls. to hhd., would give about 2½ hhd. per acre, and which is about the average yield per acre of the whole field, most of which is "M. Blanc" and "W. Transparent." I may here mention that we are now boiling our sugar very, very low, in order to obtain a greater quantity of molasses, and that when we were boiling the sugar higher we only took a little over 1,200 galls. to hhd., so that the "G. Natal," and in fact the whole field, would have given 2½ hhd. to the acre if boiled to usual ordinary height—i.e., the 3,020 galls. of juice per acre mentioned, at, say, 1,208 galls. to hhd., would be equal to 2½ hhd. per acre. The "Louzier," which is very similar to the old "Bourbon," and which some people say is such practically, I found on cutting four rows of 240 ft. each, equalling 4,800 ft., to give me 304 galls., equalling 2,758 galls. to acre, which under ordinary conditions would have given 2½ hhd. to acre, but boiling so very low would at 1,360, our yield for week, give very little over 2 hhd., or a ½

hhd. per acre below "G. Natal," "M. Blanc," and "W. Transparent." I found both "G. Natal" and "Louzier" good sound canes, free from disease, and milled easily. The only peculiarity I noticed was in the "Louzier," in which I found the ends of the leaves of the tops were nearly all dry and brown, and that its trash was very brown and decays rapidly. I got samples of the juices tested, and enclose statement of results. I have planted cuttings of both cane in a nursery, and have given cuttings to other friends who take an interest in comparison of different sorts of cane.

You can, of course, use any of these figures, etc., you wish.—Yours truly,

GEORGE J. GOODWIN.

	(a) Green, Natal.	(b) Louzier.
Total solids	2 323 lbs. galls.	2 255 lbs. galls.
Sucrose ...	2 171 "	2 056 "
Glucose ...	0 25 "	0 49 "
Non-sugar ...	1 27 "	1 50 "
Glucose ratio	12 per cent.	2 4 per cent.
Purity	92.3 "	91.1 "
Sp: Gr. ...	1 0853	1 0827

Both these juices are good, the Green Natal being especially so, the Glucose and Non-sugar being low, and the Purity and Sucrose high.

H. A. TEMPANY,
Acting Government Analyst.

Although the albumen or white of the egg has its hundred and one uses, with and without admixtures with other substances, yet there is none so peculiar as that of mixing eggs with the mortar for building purposes. Lime and white of an egg is used for mending broken china, earthenware, and glass. The large use of sand, lime, beer, and eggs for mortar is described by Mr. William Andrews in his extracts from the churchwardens' accounts of Rotherham, and the items are interesting, the entries respecting the use of ale and eggs being numerous. Hawkins, in his *Antiquities of Westminster*, 1807, quotes from a tract on Charing Cross, in which it was stated that it was so cemented with mortar made of lime, sand, and white of eggs, and the strongest wort, that it defied all hatchets and hammers whatsoever. The accounts for re-edifying of St. Mary's spire, Shrewsbury, include this entry: "Forty gallaunds of the best worte are charged at sixpence per gallaund and three shillings for eggs."

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of May, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).						
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.	Total for same period from Ju 1st, 1901.	
	Maximum.	Minimum.					Fall.	Day.			
Observatory	78.4	58.6	86.7	51.3	.91	6	.55	1st	33.90	47.92	
Stanger... ..	81.5	57.7	98.0	47.0	1.33	10	.80	14th	34.23	38.43	
Verulam	81.3	56.7	89.0	48.0	.53	5	.38	13th	32.15	40.22	
Newcastle	68.1	41.3	80	33	.65	5	.27	1st	21.97	32.15	
Estcourt	72.9	39.9	82	30	1.15	7	.35	8th	25.25	29.51	
Port Shepstone ...	79.3	50.7	84	47	.04	2	.03	2nd	...	47.81	
Umzinto	76.7	60.3	84	49	1.11	4	.52	9th	38.54	36.91	
Richmond	75.1	47.2	85	36	.47	7	.23	14th	31.14	39.28	
Maritzburg	76.9	49.0	87	36	.57	2	.48	5th	23.12	31.26	
Howick... ..	73.6	44.0	84	33	.42	2	.40	1st	19.20	29.67	
Ladysmith	76.2	39.3	87	30	1.21	3	.55	2nd	...	...
Dundee... ..	76.1	35.6	80	34	.74	6	.27	1st	25.26	...	
Weenen	77.6	39.6	87	29	.87	5	.47	1st	24.28	27.12	
New Hanover	75.1	45.1	85	32	.10	2	.10	14th	26.24	36.68	
N'Kandhla	69.8	42.1	84	31	1.25	2	.70	15th	...	...
Qudeni	64.2	42.4	75	30	2.36	15	.63	16th	43.13	57.52	
Melmoth	75.6	52.8	90	41	2.29	7	.97	16th	25.96	...	
Eshowe... ..	75.0	56.1	86	46	1.97	4	1.06	15th	39.25	51.30	
Point ... ..	...	...	...	...	.38	2	.37	14th	...	32.07
Hilton Road	72.5	45.0	83	35	.65	6	.31	1st	...	...
Nqutu	67.2	31.5	79	20	.71	7	.27	8th	22.27	...	
Mahlabatini	75.2	53.5	92	40	...	...	...	...	...	...
Lower Tugela... ..	80.1	54.6	99	45	1.69	9	1.00	15th	28.09	...	
Paulpietersburg	77.3	...	84	...	1.65	3	1.27	1st	...	...

OTHER STATIONS.

Estcourt (James Lewis) ...	74	23	1.08	5	.40	9th	26.20	30.12
Adamshurst (Wm. Adams) ...	92	43	.36	5	.14	14th	20.48	31.41
Hilton (Archibald Pearce) ...	85	39	.07	3	.04	14th	24.03	37.21
P.M.B., Town Bush Valley (Wilkinson's Nursery) ...	...	...	.82	7	.34	1st	36.56	...
Ixopo, Gorton (Chas. Green) ...	74	40	.58	7	.35	1st	11.75	20.93
Mid Illovo	77	45	.96	5	.68	2nd	33.44	43.17
Mount Edgcombe (Natal Estates) ...	94	50	.92	6	.45	2nd	33.10	53.99
Cornubia ... ..	...	...	.73	...	...	...	35.01	53.74
Milkwood Kraal ... ..	...	...	.60	...	...	...	26.25	40.17
Blackburn ... ..	...	...	.77	...	...	...	30.55	47.20
Saccharine ... ..	...	...	.80	...	...	...	30	50.28
Prospect Hall ... ..	...	...	.70	...	...	...	29.50	39.75
Clairmont (J. R. Blamey) ...	...	...	.81	4	.30	1st	...	48.71
Equeefa (W. Hawkesworth) ...	94	54	1.09	7	.45	2nd	35.10	42.07
Umzinto, Beneva (E. W. Hawkesworth)	...	...	.61	3	.51	1st	33.69	43.47
Central Experiment Farm (Manager)	83	35	.65	6	.19	1st	...	...

Agricultural Shows.

Richmond, Thursday, 30th July. President A. W. Cooper, J.P. Hon Secretary, John Marwick.

New Hanover, Friday, 24th July. Entries close 11th July. T. B. Train, Secretary.

Mid-Illovo, Wednesday, 5th August. Entries close 15th July; late entries 20th July. Hon. Secretary, W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buslow, President. Fritz Reiche, Hon. Secretary.

OTHER SHOWS.

Durban and Coast Poultry Club, Monday and Tuesday, 6th and 7th July. Entries close 24th June. Secretary, W. E. Allsopp.

Weekly Rinderpest Report up to 23rd June, 1903.

LOCALITY.	NUMBER OF DEATHS.	NUMBER OF SICK.	NUMBER OF DEATHS TO DATE FROM 26TH MAY, 1903.
Zululand—			
Eshowe District	9	13	66
Umlalazi ...	3	7	23
Lower Umfolosi	4	5	17
Nkandhla ...	15	19	66
Mahlabatini ...	1	15	19
Ndwandwe ...	4	3	14
Paulpietersburg			
District ...	1	3	3
Vryheid District	1	—	20

S. B. WOOLLATT,
P. V. Surgeon.

23rd June, 1903.

Mortality from Rinderpest during last 12 months.

	Natal.	Zulu-land.	New Territory.
From 23rd June, 1902, to July 31st, 1902	408	266	—
August 1902 ...	442	201	—
September „ ...	294	489	—
October „ ..	140	507	—
November „ ...	144	609	—
December „ ...	44	529	—
January 1903 ...	45	444	—
February „ ...	20	352	49
March „ ...	—	521	72
April „ ...	10	240	33
May „ ...	42	154	36
Up to June 24th, 1903	5	203	23
	1,594	4,515	213

Total deaths 6,322

S. B. WOOLLATT,
P. V. Surgeon.

24th June, 1903.

NOTE.—In Zululand it must be remembered that a large percentage of natives have refused to inoculate their cattle, and we have only been able to strictly quarantine such infected herds until the disease has died out from amongst them. In Zululand there are practically only natives' cattle. In Natal over 90 per cent. of the deaths shown have been amongst cattle belonging to natives.

“Since Mr. Chamberlain's effort to aid Jamaica the importation of bananas into England has risen from one and a half million to three and a half million bunches per annum”—*Our Western Empire*.

To make liquid glue which will last for years put some pieces of glue into a bottle with some whisky. Cork tightly, and set aside till the glue has dissolved. This should be ready for use without heating, but in very cold weather the bottle may be stood in hot water for a few minutes before using the glue.

Pound Notices.

THE following stock, unless previously released, will be sold on 5th August next:—

Running on the farm Doornrug, Cato Ridge. Camperdown.—Black gelding, about 14.2, indistinct brand, broken tail.

Charlestown.—Bay gelding, aged, branded, looks like 7, near rump, star; black gelding, two white hind feet, 5 years, white blaze on face, no brands.

Fort Louis.—Red-and-white Madagascar ox, cripple in left front quarter.

Pietermaritzburg.—Bay mare, branded on the near quarters Government cast brand, also small square with stroke through the middle, indescrivable brand on near shoulder, square cut tail, aged, about 14.2, seems to be in foal.

Howick.—Red and-white cow, small, aged, horn forward and turned inwards, indistinct brand on right hip.

Maritzburg Borough Pound.—Dark brown gelding; height about 14.2; white heel off hind; indistinct brand near quarters; swish tail; poor condition; aged. If not previously released, will be sold 14 days from date of *Gazette* (23rd June).

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ... W. de Bathe ... N. Grant ... J. Ralfe ...	Snelster. Otterbush. Branfontein Frere
J. Button ...	Estcourt, South of Bushman's River	"	D. W. Mackay ... E. Downing ... W. A. Bartholomew ... J. Mattison ... Unknown ... J. E. Oates ...	Dalton. Sheldale Vale Friar Tuck Klipstone Meoi River Pound. Eversdale.
J. J. Hodson ...	Lion's River ...	"	W. Henderson ...	Hilton
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Baynes ... J. A. Vanderplank	Meyer's Hoek Ntimbankulu
A. Hair ...	Pietermaritzburg City and Umgeni	"	A. Otto & Son ...	Otto's Bluff
K. Soutar ...	Portion of Lion's River	"	C. J. Smythe ... J. Chadwick ... K. Soutar ...	Stratherne Howard Stey Braes
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe.
		Lungsickness	Nkangala ...	Mount Sergeant.
W. Wilson ...	Polela ...	Scab	J. D. Watson ... H. Nicholson ... H. Brown ... J. Stone ... J. Comrie ...	Rainbow X.L. Farm Prosperity Gowrie Hepburn
L. Trenor ...	Alfred ...	"	W. Niernack ... Yolwayo & Nvuna	Macton Ilocation
A. H. Ball ...	Weenen ...	"	A. D. J. Taylor ...	Baconsfield
E. Varty ...	Umvoti, Western Portion	"	J. G. Nel ...	Elladale
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	F. Zunkel ...	Beaulieu
R. J. Raw ...	Impendhle ...	"	C. P. Speirs ... F. G. Palmer ...	Mount Park. Heron Vale
R. Vause ...	Ixopo ...	"	A. Watson ... Nkulka ...	Forest Hill English M S., High-
		Lungsickness		fiats
C. Swales ...	Umlazi ...	"	Cold Storage and Supply Co. ... Native, Sam Fawkes	Richmond Farm, near Pinetown Ansegai Kraal, near Botha's Hill

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 46 herds of cattle under license for Lung sickness, and 31 flocks of sheep under license for Scab as under:—

Natal—Newcastle Division	...	...	...	2 for Lung sickness,	— for Scab
Klip River	...	...	...	7	12
" Dundee	...	...	...	2	3
" Umsinga	...	...	...	4	2
" Upper Tugela (North of Tugela River) Division	...	...	...	—	1
" Utrecht District	...	...	...	—	2
" Vryheid	...	...	...	7	6
" Paulpietersburg	...	...	...	2	—
Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	...	2 for Lung sickness	2 for Scab,
" Nkandhla and Nqutu Districts...	...	...	...	11	3
" North of White Umfolosi and Umfolosi Rivers	...	...	...	9	—
Total	...	...	...	46	31

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndwandwe District, Nongomo District, Vryheid District, and Paulpietersburg District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 24th June, 1903.

District Reports.

IXOPO, 20th June.—There have been several very severe frosts lately, which have turned off the grass and green mealies, but the cattle look fairly well, and as there is plenty of grass suitable for hay, stock should not suffer during the winter months. It may not be generally known that there is now a pound at Erin, Dronk Vlei; Mr. Francis Clark is the Poundmaster. All Europeans who are of full age and in receipt of the equivalent of £96 per annum, and have resided six out of the last seven months

within this Electoral Division, which at present includes the Ixopo, Richmond, Polela, and Underberg Magistracies, and wish to have their names inserted on the Voters' List, should apply for the Lodgers' Franchise forms from Fieldcornets Britten, Ward No. 5; McLeod, Ward 7; Comrie, Ward 8; or A. W. Fraser, Ward 9, and these forms must be signed and handed to the Fieldcornet during this month.

FRANK E. FOXON, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—The chief event agriculturally, during the past week, has been the annual exhibition of the Pietermaritzburg Agricultural Society. The rapid strides made by this institution during the past ten years have been phenomenal, and it must be a source of gratification to the Office-bearers that the Show this year, notwithstanding the adverse season, has been the largest and most successful recorded in the Colony. The produce compared most favourably with former years, even in the face of the most disastrous season on record. Cattle, sheep, horses, etc., would have done credit to some of the Shows held in the Old Country. Unfortunately, trade is far from brisk, and the outlook cannot be regarded as favourable.

Mealies.—The prices are easier than they were a fortnight back, and owing to importations coming forward, and the reduction in the duty, there is every possibility of a further decline. Natal mealies about £1 per muid.

Hay.—Just now the samples cannot be termed first-rate, and prices have fluctuated between 1s. 6d. and 3s. 5d. per 100 lbs. Bedding from 15s. to 30s. per load.

Forage.—From 7s. 9d. to 11s. per 100 lbs.

Potatoes.—From 5s. 9d. to 12s. 6d. per 100 lbs.

Mabele.—Very little is offering. The demand is largely in excess of the supply, some fair samples realising from 13s. 9d. to 15s. 3d. per 100 lbs. It is a question if higher prices have ever been obtained on our market during the month of June.

Onions.—From 18s. to 22s. per 100 lbs.

Pumpkins.—From 2s. to 20s. per dozen.

Tobacco.—Several mornings small lots were disposed of. At one sale, only 2d. to 2½d. was realised; however, better samples afterwards realised 1s. per lb.

Poultry.—Common fowls, from 1s. 5d. to 5s. each; ducks, from 5s. 1d. to 8s. 3d. per pair; guinea fowls, from 3s. 6d. to 10s. 6d. per brace; turkeys (cocks), 8s. 6d. to 10s. each; (hens), 7s. to 8s. 6d. each.

Butter.—Fresh butter realised from 2s. 1d. to 2s. 9d. per lb.; salt, 1s. to 1s. 3d. per lb.

Eggs.—From 2s. 4d. to 3s. 8d. per doz.

Sundries.—Buck, 2½d. to 11d. per lb.; mutton, 6½d. to 9½d. per lb.; pork, 3½d. to 7d. per lb.; doves, 9d. per brace; hares, 1s. to 3s. 3d. each; ham, 11d. per lb.; partridges, 4s. 6d. per brace; and an unlimited supply of articles which obtained ready purchasers.

Fruit.—Apples, bananas, guavas, lemons, limes, naartjes, oranges, papaws, and pineapples.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, celery, eschalots, lettuce, onions, pears (Avocado), peas, radishes, tomatoes, and turnips.

Firewood.—From 5½d. to 10½d. per 100 lbs.; cut firewood, 11d. per 100 lbs.

DURBAN.—Our correspondent, Mr. W. H. Edmonds, is absent from Durban. The following price list is from the *Mercury* of the 24th inst. —

Prices on the produce market yesterday morning were as follow:—Avocado pears, 1s. to 5s. per doz.; apples, 4s. to 9s. per 100; bananas, 1s. to 2s. 9d. per bunch; bananas, 1s. to 3s. per 100; beans, 1s. to 2s. 6d. per basket; butter (fresh), 1s. 6d. to 1s. 8d. per lb.; butter, 1s. 3d. per lb.; cabbages, 2s. 6d. to 6s. per doz.; cauliflowers, 4s. to 8s. 6d. per doz.; ducks, 4s. to 5s. each; eggs, 2s. to 2s. 9d. per doz.; fowls, 2s. to 3s. 1d. each; ground nuts, 2s. 6d. per sack; guavas, 1s. per lot; guinea fowls, 2s. to 5s. 6d. per couple; lemons, 1s. to 1s. 9d. per 100; limes, 1s. to 1s. 9d. per 100; lettuces, 6d. per doz.; loquats, 2s. 6d. to 2s. 9d. per basket; mealies, 20s. per muid; milk, 6d. per bottle; naartjes, 1s. to 6s. per 100; onions, 12s. 6d. per bag; oranges, 1s. to 2s. 9d. per 100; papaws, 1s. to 2s. 6d. per doz.; peas (green), 1s. to 3s. per basket; pigeons, 1s. to 1s. 4d. each; pigs, 30s. each; pigs (suckling), 5s. to 11s. each; pineapples, 1s. to 4s. per doz.; potatoes (round), 16s. to 19s. per muid; potatoes (sweet), 4s. to 5s. 6d. per muid; pumpkins, 7s. to 8s. 6d. per doz.; sorrel, 1s. per basket; tomatoes, 5s. to 8s. per basket.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1,960, writes:—

The market has been well supplied lately with forage, chaff, Natal hay, potatoes, and onions, also green barley for forage, and dry grass for bedding, and prices are very firm throughout. Mealies, mabele, bran, and lucerne have been in demand. We can get any amount of South American bran, but what is mostly required is Colonial, though the prices are the same for both. Some new mealies and mabele have come in, the former realising 28s. 6d. per 203½b. bags. The latter has considerably brought the market down—at least 12s. per bag—since my last report to you, and being now sold in the market, from 30s. to 31s. 6d. per bag, 203½b. The price for forage has kept pretty firm, also potatoes and onions are slightly better. Natal hay sells from 5s. to 6s. per bale of about 70 to 75lbs. The prices are as follows:—

Seed Barley per bag of 163½lbs.—Of this there was not much, a few bags only being sold every day. At the commencement of the week the highest price was 17s. and towards the end of the week as much as 20s. 6d. being realised.

Green Barley for forage per 100 bundles.—Of this large quantities are offered every day, and prices seem to remain very firm. Barley on wagons is sold at from 20s. to 30s. per 100 bundles, whilst lots on the ground, of 10 to 20 bundles, from 5s. to 7s. 6d. per lot.

Bedding per load.—This is chiefly dry grass, and large quantities are offered every day, prices running from 8s. to 30s. according to size of vehicle.

Mabele per 203½b. bags.—Since my last report we have had several lots of Transvaal corn on the market, in consequence of which the price has come down considerably. This will not last long, as our crops are as scarce as the neighbouring colonies, and we shall have to depend on ourselves, or on imported stocks. Prices rule at present from 30s. to 31s. 6d. per bag.

Manna Hay per 100lbs.—Of this not much has offered, and what did come on to the market was of indifferent quality, realising from 6s. to 8s. per 100lbs.

Mealies per 203½lbs.—Some new Transvaal mealies have been offered lately, realising very fairly, from 27s. to 28s. 6d., whilst some South American yellows were sold for 25s. 6d. to 26s. 6d., and Inhambanes realised from 26s. to 26s. 6d. These prices will not remain high very long; purchasers are only buying at present from hand to mouth, as all are expecting stocks when the cheaper rates come into force.

Natal Hay per bale.—Every day some Natal hay is offered on the market, and for new stuff from 5s. to 6s. is realised, and for old stuff, from 2s. 6d. to 3s. per bale.

Out Hay per 100lbs.—Of this there is very much sold daily, and the prices remain very firm. Prices were from 10s. to 12s. for the latter part of the week, though in the former part they were a bit weaker.

Onions, 125½b. bags.—Of this produce the market is very well supplied daily with both Colonial and Australian. Prices were very weak at the commencement of the week. Both firmed up towards the end, and are now standing at 15s. to 20s. per bag.

Potatoes, per 163½lbs., per bag.—Local potatoes are a little scarce now. Those that do come in, however, realise fairly well, from 28s. to 32s., whilst of district and other potatoes coming per rail, the best realise from 22s. to 27s.; medium, from 18s. to 20s.; inferior, from 10s. to 15s.

Poultry.—Ducks, from 6s. to 8s. each; fowls, from 2s. to 3s., and from 4s. to 5s.; geese, from 8s. to 10s. each; turkeys (hens), from 8s. to 10s., cocks, from 15s. to 17s.

Eggs, per dozen.—Local, new laid, from 3s. 6d. to 5s.; for imported, from 1s. 6d. to 2s. 6d.

Cattle.—Slaughter oxen, £20 to £22 10s.; truck oxen, from £15 to £18; cows, from £11 to £14; milch cows, from £25 to £35; sheep and goats, according to condition, from 17s. 6d. to 30s.

Horses.—From £10 to £15, and £20 to £25.

Mules.—From £10 to £20.

The Agricultural Journal

AND MINING RECORD.

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Judging at Shows.

AT this time, when the Show season is drawing to a close, a fitting opportunity is offered for discussing the subject of show judging. Judging is the very foundation of agricultural shows. A few individuals may be able to do their own judging in classes wherein they take particular interest, but to the bulk of the visitors the matter is as a closed book. Some animals have first, second, or third prize tickets on them, but to those cursorily or even critically inspecting the exhibits the labels convey but little satisfaction or instruction. With all deference we submit that the

time has come when those who are most capable of dealing with the question should make a move to increase the educational features of our shows. Mr. E. O. Challis, the Government Dairy Expert, when responding for the judges at the Estecourt Show dinner, affirmed as a general proposition that judges should always be able to give their reasons for their awards, and should be willing to give those reasons freely. Whether Mr. Challis was thinking at the time of other than dairy exhibits we cannot say, but undoubtedly in those words he touched the very root of the important question,

The educational element of a show is the first and great essential, and if this fact is not recognised the show becomes chiefly an excuse for a holiday. Judges at shows, we are inclined to think, should, where possible, be like judges of law, professional. They should be able to criticise to a nicety, and they should be able to state plainly why they arrive at their decisions. Although statement by word of mouth in addition is much preferable, yet, in default, a card nailed to a prize winner's stall which gives the points won serves as a useful substitute. This latter system is adopted by several English Shows, and has proved useful and attractive. Relative to this subject we give a few quotations from the Annual Report of the Ontario, Canada, Fairs and Exhibitions for 1902. From an address by the Minister of Agriculture of that State we take the following: "The gentlemen looking into my face to-day perhaps do not realise as I do the hunger and thirst that exists for information all over the country—it is not for amusement, but for information. If agricultural societies will undertake to give this information effectively they will be ten times as popular as they are to-day, or ever have been. What does an Agricultural Society undertake to do by bringing together these animals and presenting the best products at Shows? Some people seem to think the object is that they may give prizes to this man and the other; but the giving of these prizes is only a means that is used towards another end. The end and object of it all, as contemplated by the framers of the Act, was to present the proper ideals to the people, so that they might know exactly what was the best thing and what they ought to produce in the best interests of the country. I can fancy a young man that is without information, but has become interested in agriculture, looking on and saying: 'I should like to know how to produce them, but your society does not give the information. I should like to know what they mean by putting that animal first; the other one looks better to me—but I can get no information.'"

"Expert" judges for judging at the Agricultural Shows are supplied by the

Ontario Department of Agriculture. Their reports for the year 1902 are lengthy and instructive; we take the following from what the cattle judge says:—"The people seemed to be well pleased with the work of the judges, as they found us always able and willing to give reasons for the awards made, and if a particularly good animal was brought out we always made a point of calling attention to it, and to point out the difference between it and an inferior one. The people seemed to appreciate this, and showed every desire to learn what they could from us."

From a Report of another of the judges we give the following extract:—"The sending out of judges, with instructions to give their reasons for making their awards in class after class, was a new departure, and in the line of experiment you may be sure we considered our positions were responsible ones. Besides that, we individually felt our reputations were at stake, so, therefore, little room was left for slipshod or careless work, or partiality either, should such temptation present itself. As so much work happened to fall my way, little or no time was left me to see what my colleagues were judging. When judging I worked (as explained to the listeners, of whom there were many, the ring sides being packed day after day) from the following standpoints: (1) type; (2) form; (3) flesh; and, in case of sheep (4) fleece; and gave my reasons along these lines. Whatever the verdict of the public may be regarding the experiment, we had the satisfaction of seeing intense interest taken in the proceedings, and most courteous were the spectators and exhibitors to us throughout. Many kind words of approval would frequently float in from the crowd; and, now that the work is done, we are gratified in leaving, to learn that the secretaries of Fair boards have officially reported favourably on our doings. . . . Giving reasons for making awards appears to have proved a drawing card, as all the Fairs we attended were well patronised by the public. I am now satisfied that it is the proper way to judge, as the onlookers can learn more, the exhibitor knows wherein his exhibits

excel, or fail, and the one doing the work is apt to have his wits sharpened by an unlooked-for question by some interested spectator.

The subject which we have here ventured to broach is not without difficulties, but difficulties as a rule can be overcome. The great fact to be borne in mind is that explanatory judgments are educational in the highest degree.

and, unlike many forms of education, are extremely attractive. To convey instruction and therewith reap pecuniary reward are surely objects which deserve the most serious attention of the managers of our shows. Any communication, from whatever point of view, to the *Journal* on this question will be most welcome.

Passing Notes.

SUPPLEMENTARY PAGES.—Owing to the accumulation of matter during the recent printers' strike, and to the desirability of giving early publication to certain lengthy reports, this issue contains twenty-four supplemental pages.

OSIER CULTIVATION.—In an *Ergates'* interview with Mr. P. D. Simmons, Mooi River, allusion was made to the growing of willows along the banks of Mooi River for basket making. Mr. Simmons was of opinion that there will be a demand for baskets in the Colony, and that as coolies are adepts at basket-making the growing of the material should be profitable. In England special attention is being given to this industry at the present time, owing to increased demand. Annually from Belgium and Holland there is an importation of about £100,000 worth of osiers and baskets. In England there are many varieties of willows, which are known under such names as pawmers black Germans, yellow Spaniards, white Norfolks, redskins, blue buds, stone-roses, merrills, and bitters, but for basket making and wickerwork generally the red sallow (*Salix purpurea*) is the favourite. This kind is also first class for wattle work of all kinds. There can be little doubt that there will be a considerable demand for baskets as soon as they are offered in quantity, and there can be no doubt that plenty of coolie labour will be available for the industry.

THE ADVANCING COOLIE.—The coolie, to use the generic word common to Natal, is becoming quickly a prominent agriculturist in the Colony. Some time ago it was thought that his energies would be confined to the Kafir trade and store-keeping in villages. That belief has proved to be incorrect, and up-country farmers, when going for their annual trips to the Coast, see from the railway more and more land every year under coolie cultivation. Until recently the Coast coolies were exclusively tenants; now many are landowners, and several on a large scale. A few weeks ago one of them advertised in the papers in the usual form that he would prosecute all trespassers on his estate. Another has a large gang of indentured fellow-countrymen. Besides fruit growing—chiefly bananas and pineapples—the Coast coolies largely cultivate mealies, beans, and tobacco. Of mealies this year there is barely half a crop, and the coolies get at present about 21s. per muid from wholesale buyers, and about 25s. from Kafir purchasers of odd sacks. Tobacco for three or four years has been a good source of income to them—most of the tenants growing about half a ton, and others a couple of tons and upwards. At present tobacco is a drug, the price being weak at 3d. per pound; last year a price from 4d. to 4½d. was easily obtainable. By way of compensation the bean crop has been a fairly good one, and instead of the usual price of 14s. per muid,

£2 is now to be got. On the whole, the Coast coolies have done well this year; they might indeed have done better, but, as farmers, their frugality enables them to "carry over" easily in the event of lean seasons.

THE RHODESIAN DISEASE.—Elsewhere will be found Professor Koch's second report on this disease. From this report it is to be gathered that Professor Koch finds the Rhodesian Disease to be African Coast Fever, and that the latter fever is distinct from the Redwater of South Africa. Certain experiments had remarkable results. Virulent African Coast Fever blood in very large doses (2,000 c.c.) was injected into susceptible animals and no reaction was shown. Inoculations, and they were many, indicate that the direct inoculation of healthy animals with the blood of animals suffering from African Coast Fever will not reproduce the disease, and this remarkable fact separates still further African Coast Fever and Texas Fever. In the one case no result follows blood inoculation, while inoculation with blood from the less fatal Texas Fever is attended by most serious results. Secondary inoculation on twenty-one of these animals was tried, and in ten cases there was a slight reaction. To get at the cause for the spreading of the disease experiments with ticks have been commenced. Experiments also are in hand for obtaining a curative serum.

GRADING DAIRY CATTLE.—Three very valuable articles on this subject appear in the present issue. They have been written by men who take exceptional interest in the subject dealt with. The opinions expressed are not merely the outcome of theory based on knowledge acquired in other countries, but have been evolved from views successfully carried out under the climatic, disease, and labour conditions of this country. For further information from the writers readers are referred to *Calf Rearing by Hand*, by Geo. D. Alexander, No. 17, Vol. IV. *Shorthorns*, by P. D. Simmons (interview with Ergates), No. 19, Vol. IV. *Cattle*, by Wm. Woods (interview with Ergates), No. 2, Vol. V. In the

next issue Mr. E. O. Challis, the Government Dairy Expert, will review the articles now appearing.

PASPALUM DILATATUM.—In this issue we have the pleasure of publishing an illustration such as will, we trust, enable every one to identify this popular grass. For the illustration we are indebted to Mr. J. Medley Wood, A.L.S., Curator, Botanic Gardens. The drawing is by Miss F. Lauth, Mr. Wood's senior assistant in the Herbarium.

VEGETABLE POISONING.—In the monthly reports of the District Veterinary Surgeons reference will be found to two small epidemics of what appears to have been vegetable poisoning. In both instances *Paspalum scrobiculatum* is suspected as the agent. This grass is common throughout the Colony now, and Mr. Medley Wood gives considerable evidence as to its evil repute. It is to be hoped that the suggestion of Mr. Webb to have its properties tested will be adopted. In the Old Colony about five years ago a disease in goats known as nenta was believed by many to be caused by the succulent weeds cotyledon and crassula. This view was not supported by Mr. MacOwan, the Cape Government Botanist. He suspected certain leuminous plants. There was much controversy on the matter, and it only terminated at the beginning of the war, the questions at issue being left still open.

ORIGIN OF NATAL REDWATER.—Ergates writes:—So much interest is now being taken in the question of what is Redwater, what is African Coast Fever and what is not, that it may interest some younger Colonists to learn that Natal Redwater is not a local product, is not endemic to the Colony, but from somewhere or other—arrived. The fact was convincingly stated in a conversation I recently had with Mr. James King, of Lynedoch, Balgowan. He offered no objection to the printing of what he said, which was:—"For twenty years after my arrival in this District—from a cattle breeder's point of view—Redwater was unknown. Previous to 1870 cattle

could be brought up-country from England or elsewhere with all security, provided they were kept free from Lung-sickness. That was then the only disease importers feared. Redwater appeared in Natal coincident with the introduction of Madagascar oxen on the Coast. Some people go so far as to say that the disease was brought to the Colony by the Madagascar oxen. How the disease spread is easily explained. In 1871 and the following year large numbers of wagons were placed on the road for taking transport to the then newly discovered diamond fields at Kimberley. The disease at that time was in a much more virulent form than now, or, what is more probable, the immunity of Natal cattle was less, or indeed possibly, non-existent. On several occasions when taking farm produce to Maritzburg, before the opening of the railway, I have seen wagons stranded on the road, not an ox remaining. The disease would be brought to the herds of up-country farmers through the sending of the farm oxen on the high veld. These oxen would contract the disease, and on their

return disseminate it. By avoiding the public outspans for outspanning farmers, as you know, used to be able to send to Maritzburg with small risk of the oxen contracting the disease. These facts, to my mind, seem to prove that there are other mediums than the tick for communicating the disease. I may mention that the small tick common down country has never yet made its appearance in this neighbourhood. I incline to the opinion that the land over which diseased oxen were grazed was infected by their excreta, especially the urine, and that this fouled land was really in most instances the source of contamination. Experience proved, in cases of outbreaks, that the best plan for stopping the disease was that of changing the pasture. As to whether the Madagascar oxen introduced our Natal Redwater, or whether the disease from which the Madagascars were immune was the so-called African Coast Fever or a modified form of it, I shall offer no opinion. All that I shall venture to say on the subject is that there is much yet to be learnt about it."

Central Experiment Farm.

WORK FOR JUNE.

DIRECTOR OF AGRICULTURE—

THE work done during the month of June has been very satisfactory. The principal work has been the harvesting of buckwheat, mealies and potatoes form the main crop, and the experimental plots. Tabulated results of the latter have already been placed in your hands.

The yield of mealy grain off the main crop will probably be small. The horse tooth suffered from the early frosts, and has been cut for cattle food.

What ought to be a very interesting trial is now being made, that is the clearing of the ground thoroughly of all stalks and roots which would in any way be an encouragement for grubs. This is being done by loosening the soil with a Martin's cultivator, an implement mentioned by the writer of Farm Notes in

the *Times of Natal*, and can be seen at work any time. The roots are then pulled out.

A 6-furrow disc plough will be in use very soon.

The permanent buildings are now being pushed on with all possible speed; a good deal of the labour required has been supplied by the Farm.

The experimental paddocks have been carefully surveyed, and a good part of the fences have been erected.

A great convenience to the Farm now is the new railway siding, Reitspruit, and I shall be glad if it can be made publicly known that all correspondence to the Farm ought to be addressed—C.X.F., Reitspruit.

ALEXANDER REID,
Farm Manager.

Weekly Rinderpest Report.

UP TO 7TH JULY, 1903.

Zululand.

Eshowe District.—16 dead ; 16 sick ; number of deaths to date from 26th May, 1903, 93.

Umlalazi District.—No deaths ; 2 sick ; number of deaths to date from 26th May, 1903, 25.

Lower Umfolozi District.—1 dead ; no sick ; number of deaths to date from 26th May, 1903, 18.

Nkandhla District.—26 dead ; 30 sick ; number of deaths to date from 26th May, 1903, 117.

Mahlabatini District.—10 dead ; 14 sick ; number of deaths to date from 26th May 1903, 37.

Ndwandwe District.—8 dead ; 3 sick ; number of deaths to date from 26th May, 1903, 26.

Paulpietersburg District.

No deaths ; no sick ; number of deaths to date from 26th May, 1903, 3.

Vryheid District.

1 dead ; 6 sick ; number of deaths to date from 26th May, 1903, 24.

S. B. WOOLLATT,
P.V. Surgeon.

Garden Notes for July.

By W. J. BELL, Florist and Seedsman, Maritzburg.

KITCHEN GARDEN.—Peas may be sown this month, except in the coldest parts of the Colony, where a month later would be preferable.

The best varieties are Harrison's Glory, 2½ feet ; Doctor McLean, 3 feet ; Yorkshire Hero, 2½ feet ; and Pride of the Market, 2 feet.

Sow the seed in drills about 3 feet apart. The soil should be enriched with well-decayed manure and wood ashes. As regular watering will have to be done, it is a good plan, immediately the seed is sown, to cover with a little light litter, which will prevent the surface from hardening through constant watering. One pound of seed is sufficient for about 40 feet of drill.

Small sowings may be made of Lettuce, Radish, Turnip, Carrot, Spinach, Onion, and Leek.

After the middle of the month the following vegetable seeds may be sown in boxes under shelter with a little bottom heat, such as a hot bed will

afford :—Tomato, Cucumber, Marrow, Melon, Egg Plant, and Capsicum.

A hot bed suitable for this purpose is easily and quickly made with fresh littery horse manure, and should be built up about 3 feet deep and large enough to take the size of frame required.

After the bed has settled down a little make it quite level, put the frame on, and fill in with a few inches of dry soil or coal ashes. On this place the boxes or tins in which the seeds are to be sown, and cover the frame with a glazed sash. After the seedlings are through the sash should be opened a little in the daytime, but should be closed up before sunset and the glass covered with matting or sacking till morning. By this means plants can be had ready for planting out immediately frosty nights are over, and will be a month in advance of those grown in the ordinary way. Without the bottom heat it is very little use sowing the above-mentioned seeds, and

seeds of cucumber and melon will rot in the ground, which at this time of the year is too cold for them.

The pruning and planting of all kinds of deciduous Fruit Trees, Vines, flowering Shrubs, and Roses should be done this month, and cuttings put in where required.

The following is a list of fruit trees that should be planted in July:—Apricots, Nectarines, Peaches, Plums, Apples, Pears, Quinces, Medlars, Walnuts, Figs, and Raspberries.

Citrus and other evergreen fruit trees should be planted later, at the commencement of the wet season.

Flower Garden.—Sow in boxes Pansy, Daisy, Carnation, Forget-me-not, Hollyhock, Lavender, Pentstemon, Pyrethrum, Sweet William, Verbena, Wallflower, and Columbine; and in the open ground, to succeed the earlier sowings, the following may be sown:—Alyssum, Calendula, Candytuft, Coreopsis, Cornflower, Dianthus, Eschscholtzia, Gaillardia, Godetia, Larkspur, Linum, Mignonette, Petunia, Phlox, Poppy, Sweet Sultan, and Salpiglossis, Scabions.

This is the best time to sow tree seeds, such as the various kinds of Pine, Cypress, Cedar, Cryptomeria, Juniper, Casuarina, Thuja, Gum, etc.

Sow the seeds in shallow boxes and see that they are well drained by having holes at the bottom and a layer of broken brick or stone, then a few inches of rough fibrous soil, and then fill up to within an inch of the top with nice sandy soil.

Place the boxes on bricks or stones and see they are perfectly level, so that when they are watered the water will soak in evenly. Before sowing give a good soaking with fine water can, and then sow the seeds evenly on the surface. Cover the smaller seeds with a quarter of an inch of finely-sifted sandy soil, and the larger seeds, such as Pines and Cedars, with about an inch. Cover with straw or hay until the seedlings show through, and gradually remove it as required.

After sowing they must not be allowed to want for water, or failure will result.

Towards the end of the month fork the soil round herbaceous plants and Chrysanthemums and mulch with well-decayed manure, and as soon as growth commences water freely during dry weather.

Shropshire-Merino Cross.

THE following is taken from the Bradford letter of *The Empire*:—

All along the advice of *The Empire* has been of a most up-to-date order; and, though ridiculed by some who ought to have known better, yet for all that the latest results are on the side of the lines always advocated by this paper, and its valued correspondents. For several years now the writer of this fortnightly article has strongly advocated the crossing of the Cape merino with an English-bred ram—the Shropshire or Lincoln having the preference. We are glad to know that the arguments set forth from time to time have been read

with interest, both by big and little; but are better pleased still at knowing that certain ordinary sheep-farmers have put our recommendations to the test, and are now awaiting results by this outgoing Cape mail. Let us now look at the facts.

It will be remembered by many readers (says *The Empire*) that we gave some two years ago a number of articles under the head of "The Shropshire-Merino Cross." Mr. W. A. Hart, of Hartfield, Cathcart, Cape Colony, was induced to import several pure-bred Shropshire rams belonging to the well-known flock of Messrs. Cooper—the

manufacturers of the well-known sheep-dip mixture—and at once on their landing on his farm mated them with his pure-bred Cape merino ewes. This was in 1896. When he came to shear in 1897, through recommendation he was good enough to ask the writer if he would personally superintend the sale of his clip on the London Wool Market, and take absolute control of it. This the writer did, and the results realised gave more than entire satisfaction. It was noticed last year that the result of the cross before mentioned had left a distinct mark of improvement on the Shrop-merino progeny; and, besides having stronger and better lambs, his fleeces when sold realised equally as much as did his pure-bred merino, much to the surprise of Mr. Hart and his friends.

But a year has passed, and those who glibly prophesied the cross would be a failure will be more "capped" still when to-day's Cape mail reaches South Africa. Once again the writer was asked if he would look after the sale of the same clip on the London Market, and we need only say we complied, as we would be happy to to-day to any Cape farmer. The firm of Messrs. Buxton & Co. included in their catalogue the small clip sent by Mr. Hart, and though only ten bales were sold, yet we venture here to give the results:—

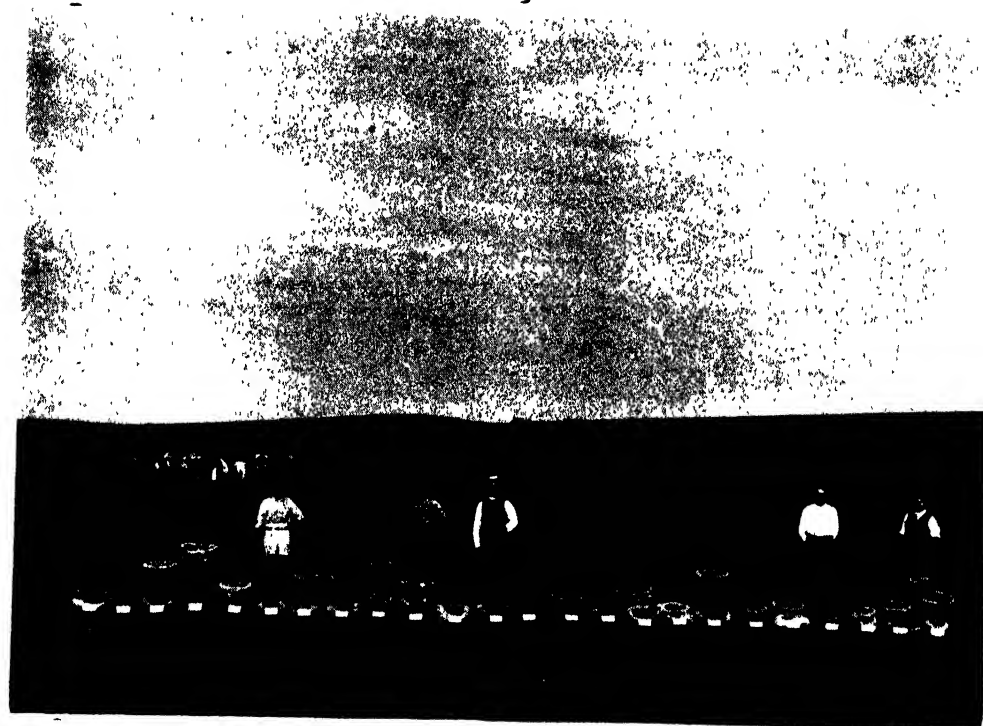
	Lot.	Mark.	Bls. Pce
Greasy super combing	329	{ W. Hart, Hart- field, Cathcart }	5 8½d.
" " "	329A	...	3 7½d.
" x bred (Shropshire Rams)	329B	...	1 6½d.
Greasy Skir's	330	...	1 5d

"A small clip indeed, and offers no criterion as to what a big lot will sell for," says some prejudiced opponent of the cross-bred progeny. But I answer that facts are stubborn things, and the fact that such a high price as 8½d. and 7½d. was realised for the combing fleeces will weigh far more with a farmer whose clip is selling at 5½d. to 6½d.—as does the vast majority of Cape farmer's clips. The character of wool as shown by this

farmer's clip was just the style and breed of wool that men are seeking after to-day, and I venture to say that no other ordinary farmer's crop in the Cathcart district will realise as high a figure as does the above. Then there is the mutton value of the animals to consider. The returns on this score far outweigh the merino, and with present demand and good prices for first-class mutton in South Africa, the Shrop-merino cross fills the butcher's bill to perfection. We could say a good deal more, but recommend the stubborn facts to all thinking farmers.

A correspondent, writing to the "Sydney Daily Telegraph," lays particular stress upon the value of the "date palm" as a food-producing tree, and suggests that it is certainly worth cultivating. There are two varieties which are specially recommended, viz., "Datheressifa," an early kind, and "Zadie," a very heavy cropper. Thousands of these date palms have been planted by the French Government in their African possessions, and the writer says it is a matter for regret that the New South Wales Government are not sufficiently enterprising in regard to the planting of valuable food-producing trees.

"Hobson's choice" is a proverb which is frequently used by many unacquainted with its origin. But Mr. C. E. Harper, in his new book on the Cambridge Road, throws considerable light on the subject. Thomas Hobson (says Mr. Harper) was the famous carrier between London and Cambridge, and died in 1631. It was from him that the phrase originated, meaning a choice that is no choice. Mr. Harper adds:—"The saying arose from the livery stable business carried on by Hobson at Cambridge, in addition to his carrying trade. He is, indeed, said to have been the first who made a business of letting out saddle horses. His practice, invariably followed, was to refuse to allow any horse in his stables to be taken out of its proper turn. 'That or none' was his unfailing formula when the Cambridge students, eager to pick and choose, would have selected their own fancy in horse-flesh. Every customer was thus served alike, without favour."




1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Bags of Potatoes from Manure Plots, Set A, on Hill Soil,

CENTRAL EXPERIMENT FARM,

16th Jan. to 1st May, 1903.

Those marked thus  were from unmanured plots. The little bags in front contain the small Potatoes.

Correspondence.

To the Editor *Agricultural Journal*.

TROUT PRESERVATION.

SIR,—The late Col. Bowker, an eminent South African naturalist, attended before the committee for introduction of trout and salmon in 1899, and gave it as his opinion that there was nothing to be feared from the South African otter. He believed the otter lived entirely on crabs, and that it was unlikely that he would take to catching fish.

This favourable estimate is quite wrong, and the otter is now charged with wanton destruction of trout.

When the trout ponds were built, and before the covers were put on, an otter found them out, and from No. 1 pond, containing fifty young trout, he took twenty; and out of No. 2 pond, containing five Umgeni trout, he took three.

Last week the grass on one side of the stream here was burnt. On each side of the stream was a thick bed of reeds, and when the fire had burnt off one side, the opposite bank was easily seen. On a ledge just above the water line, three trout were lying, and the remains of three more. The three, which were quite fresh, and recently caught, were

carried home and weighed. They were all of them female trout and full of eggs, not quite ripe. One was 18 inches long, weighed $2\frac{1}{2}$ lbs., and the other two 13 $\frac{1}{2}$ inches long, weighing together 1 $\frac{1}{2}$ lbs.

A native was provided with a trap, a steel trap, used for catching cats. It was set amongst the remains of the three fish which had been eaten. The otter, a male, and web footed, was caught next morning, and the native got his promised reward.

This is written with the hope that it may be seen by those gentlemen who have got trout in their streams, and induce them to take measures to reduce the number of otters in their districts. There are a great number in the Bushman's River. The Mooi River is infested with them. Last year, when the Camperdown Reservoir was stocked with trout, four otters were reported by the caretaker as living there.—Yours, etc.,

JOHN C. PARKER.

Tetworth, Curry's Post,
June 22nd.

Central Experiment Farm.

REPORTS OF MANURE EXPERIMENTS.

By the DIRECTOR OF AGRICULTURE.

POTATOES ON HILL SOIL.

THE picture shown is a reproduction of a photograph of the bags of potatoes harvested from a set of manure experiment plots on the hill soil at the Central Experiment Farm, Reit Spruit. This picture shows some exceedingly striking contrasts; thus, for instance, bags No. 4, from a manure plot, compared with bags No. 5 from an unmanured plot, or bags No. 10 compared with No. 11. The contrast between the appearance of the plants growing on the different plots

was equally striking, and to the eye there was every prospect of crops of 6, 7, or 8 tons of potatoes being harvested per acre from some of the plots. But this prospect was suddenly cut off by blight, which destroyed the leaves and haulms soon after blossoming. Notwithstanding this, however, the best manured plot gave a crop which was very nearly double the average potato crop of Natal. The unmanured soil yielded on the average only 10 $\frac{1}{2}$ cwt. of potatoes

per acre, while the best manured plot gave a yield of 3 tons 6 cwt. 28 lbs. per acre, as compared with the country's average of 1 ton 16 cwt.

There were two sets of potato manure experiments on the hill; one, called Set A, having superphosphate as the principal phosphatic manure throughout the series; the other—called Set B—having basic slag as the principal phosphatic manure. There were 24 plots in each set, each plot being 1-20th acre in area. The ground was prepared in the same way for all the plots, and in each set the potatoes were all planted on the same day. Every condition, except the manuring, should have been as near alike as possible on all the plots: unfortunately, however, the seed was not as uniform in quality as it should have been. Good seed was ordered in ample time through a local seed merchant, but through some misunderstanding the order was not trans-

mitted to England; consequently when the time came for planting such seed had to be purchased as was obtainable. For Set A cases of Beauty of Hebron, bearing Sutton's stamp, were used throughout, but the cases used for the first three plots were obtained from a different seedsman from the one who supplied the cases for the other plots. This seed turned out to be in bad condition, and only 20 per cent. of it produced plants. In all field experiments the seed, unless it is intended to be different for different plots, should be thoroughly mixed together so as to ensure uniformity. Owing to the omission of this essential precaution the potato experiments this season are not of the value that they should have been. Nevertheless they have considerable value.

The actual results are given in the following table, which, with the notes at the bottom, will explain itself:—

MANURE EXPERIMENTS, CENTRAL EXPERIMENT FARM, 1902-3.

POTATOES, ON HILL SOIL (RED LOAM.)

Set A; Superphosphate Section.

Variety of Potato: Beauty of Hebron. Planted, 16th January, 1903; harvested, 1st May 1903.

No. of Plot	Nature of Manure.	Yield per Acre.		Grain. Due to Manure.	Estimated Gain with Good Seed.	No. of Plants in Stock Plot.
		With Manure.	Without Manure			
		Tons C'ts. lbs.	Tons C'ts. lbs.	Tons C'ts. lbs.		
1	N.P.K.l	7 36	90	6 50	} Bad Seed {	94
2	No manure		90			53
3	N.P.K.m.	1 7 88	90	1 6 100		190
4	N.P.K.h.	3 6 28	16 8	2 10 20		451
5	No manure		17 16		} 1 4 41 2 0 7	536
6	-P.K.m.	2 13 24	17 43	1 15 98		481
7	N.-K.τ.	18 84	17 70	1 14		526
8	No manure		17 96			523
9	N.P.-m.	2 17 56	17 49	2 0 7		540
10	-P.-m.	2 17 16	17 2	2 0 14		534
11	No manure		16 68			509
12	-P.-m.	2 11 48	15 80	1 15 40		523
13	-B.-m.	1 10 40	14 92	0 15 60		514
14	No manure		13 104			523
15	Lime	8 4	11 81	(loss, 3 77)		535
16	N.P.K.m. Lime	1 2 96	9 58	12 38		457
17	No manure		7 36			392
18	N.P.K.m. Lime	1 12 76	8 44	1 4 32		374
19	Gyps'm	10 80	9 52	28		357
20	No manure		10 60			397
21	N.P.K.m. Gyps'm	2 2 56	11 8	1 11 48		420
22	N.P.K.m.*	2 0 0	11 68	1 8 44		421
23	No manure		12 16			479
24	N.P.K.m.†	2 9 72	12 16	1 17 56		525

Set B; Basic Slag Section.

Variety of Potato: Windsor Castle.

Planted, 14th January, 1903; harvested, 14th May, 1903.

1a	N.P.K.l.	11 108	5 80	6 28		346
2a	No manure		5 80			341
3a	N.P.K.m.	13 44	4 72	8 84		294
4a	N.P.K.h.	13 64	3 44	10 24		263
5a	No manure		2 36			151
6a	—P.K.m.	13 104	2 96	11 8	Seed Doubtful	286
7a	M.—K.m.	4 92	3 44	1 48		292
8a	No manure		3 104			264
9a	N.P.—m.	15 80	5 20	10 60		315
10a	—P.—m.	16 56	6 48	10 8		406
11a	No manure		7 76			412
12a	—P.—m.	1 12 56	8 104	1 4 64		495
13a	—B.—m.	18 4	10 20	7 96		512
14a	No manure		11 48			528
15a	—Lime	12 16	11 41	97		544
16a	N.P.m.K. Lime	2 3 104	11 35	1 12 69		544
17a	No manure		11 28			526
18a	N.P.K.m. Lime	1 11 28	11 28	1 9 0		541
19a	—Gyps'm	12 56	11 28	1 28		544
20a	No manure		11 28			544
21a	N.P.K.m. Gyps'm	1 12 56	11 21	1 1 35		544
22a	2N.P.K.m.*	1 8 64	11 15	19 49		544
23a	No manure		11 8			541
24a	N.P.K.m.†	1 3 84	11 8	12 76		538

EXPLANATIONS: *Half the N. given as top dressing. †All the N. given as top dressing.

N. means Nitrate of Soda.
P. " Superphosphate.
P " Basic Slag.
B. " Bone Dust.
K. " Potash Chloride.
l. " Light Dressing.
m. " Medium Dressing (twice as much as l.)
n. " Heavy Dressing (three times as much as l.)

Quantities
of
Light Dressings

Quantity of Lime used—10 cwt. per acre.
Quantity of Gypsum used—5 cwt. per acre.

N.— $\frac{1}{2}$ cwt. per acre.
P.— $1\frac{1}{2}$ cwt. per acre.
P.— $1\frac{1}{2}$ cwt. per acre.
B.— $1\frac{1}{2}$ cwt. per acre.
K.— $\frac{1}{2}$ cwt. per acre.

The full number of plants per plot should have been 556.

The last column in these tables shows the number of plants which grew in each plot. The number should have been approximately equal in each case. From Plot 7 to Plot 15 in Set A the seed appears to have been uniform, and from 13a to 24a in Set B also. If all the series had been like these portions the results would have had a very high degree of reliability.

This irregularity is, perhaps, for some reasons better at the present stage of the farm's development than absolute regularity. It will serve to show to both the public and the farm staff the amount of care and trouble necessary for reliable experimental work.

The chief facts brought out by these experiments are the extraordinary natural poverty of the soil, and the profitableness of applying soluble phosphatic manures thereto.

The heaviest crop was on Plot 4 of Set A, this crop being at the rate of

3 tons 6 cwt. 28 lbs. per acre. Of this amount, 16 cwt. 8 lbs. was due to the natural productiveness of the soil, and 2 tons 10 cwt. 20 lbs. was due to the manure. The manure used on this plot was a complete manure, consisting of—

2 cwt. nitrate of soda
4 cwt. superphosphate
2 cwt. potash chloride } per acre

On Plot 3 a medium dressing of this mixture was given. This medium dressing was $1\frac{1}{2}$ cwt., $2\frac{1}{2}$ cwt., and $1\frac{1}{2}$ cwt. respectively. Unfortunately the result on Plot 3 was spoilt through the badness of the seed. But it may be assumed that the actual increase due to the medium dressing of manure, had the seed been good, would have been 2 tons 7 lbs. per acre. How much of this increase would have been due to the nitrate of soda, how much to the superphosphate, and how much to the potash salt?

The next best result to that on Plot 4 was obtained on Plot 10 with superphos-

phate only. This was a better result than that obtained on Plot 24 with the complete manure medium dressing, or on Plot 9 with nitrate of soda and superphosphate mixed, or on that from Plot 6 with superphosphate and potash salt mixed. Whereas on Plot 7, with nitrate of soda and potash salt, but without superphosphate, the result was almost the same as with no manure at all. Clearly then superphosphate is the constituent of the complete mixture which did the work on Plot 4, and we may conclude that on a soil such as that experimented upon, and with similar seed and season, 4 cwt. of ordinary superphosphate would produce $2\frac{1}{2}$ tons of potatoes.

The question now arises as to the profitability of this manure. The superphosphate actually used contained phosphoric acid as follows :—

	Per Cent
Phosphoric Acid, water soluble ...	17.11
" " citrate soluble ...	1.13
" " insoluble ...	1.10
Total ...	18.34

The cost of this at Durban was £6 15s. per ton, and delivered at the farm £7 5s. The cost of 4 cwt. would, therefore, be £1 9s. For this expenditure $2\frac{1}{2}$ tons increase in the potato crop was obtained, and this, reckoned at £8 per ton, would be worth £20. There can, therefore, be no question as to the profitability. But the superphosphate actually employed was not the cheapest obtainable. There has been recently offered in the local market a superphosphate which is said to contain approximately as follows :—

	Per Cent.
Phosphoric Acid, water soluble ...	16.5
" " citrate soluble ...	1.5
" " insoluble ...	.5
Total ...	18.5

This was offered at £4 10s. per ton, and would cost at the farm about £5. The cost of 4 cwt. would, therefore, be only £1.

But there is another superphosphate which would cost at the farm a trifle less than even this, and at greater distances from Durban appreciably less. This is the highly concentrated super-

phosphate containing $46\frac{1}{2}$ per cent. of phosphoric acid, mostly water soluble. Such a material is manufactured by H. and A. E. Albert, Chemical Works, 150, Leadenhall Street, E.C., London, and its cost, f.o.b. Hamburg, is about £8 3s. per ton. It can be landed at Durban at a cost of £11 17s., and at the farm at £12 7s. per ton. I am informed that other firms also manufacture a similar article. One ton of such material is equal to $2\frac{1}{2}$ tons of a superphosphate containing $18\frac{1}{2}$ per cent. phosphoric acid; and instead of using 4 cwt. to get the same result as that on Plot 4, only $1\frac{1}{2}$ cwt. would be needed. This would cost 19s. 9d. Nineteen shillings and ninepence is not much to pay for a return of £20.

As to the comparative effect of superphosphate and the other sources of phosphoric acid, namely, basic slag and bone dust, both Set A and Set B of the plots show the superior activity of the superphosphate. The superphosphate on Plot 10 gave an increase of 2 tons 14 lbs., whereas an equal quantity of basic slag on Plot 12 gave an increase of only 1 ton 15 cwt. 40 lbs. On Plot 10a the slag gave an increase of 10 cwt. 8 lbs. but in this plot there were several misses, owing presumably to defective seed. If allowance be made for these misses, the result would be a gain of 12 cwt. due to the slag. But on Plot 12a the superphosphate produced a gain of 1 ton 4 cwt. 64 lbs. Again, Plot 16a, in the mixture of which superphosphate was used, gave an increase of 1 ton 12 cwt. 69 lbs.; whereas Plot 18a, with slag, gave an increase of only 1 ton. On Plots 16 and 18 these results were just the reverse; but an exceptional result such as that cannot be accepted without confirmation. The comparative effects of superphosphate and slag may, therefore, be summarised as follows :—

Superphosphate.				Basic Slag.			
		Tons.			Tons.	Cwt.	Lbs.
Plot 10	...	2	0 7	Plot 12	...	1 15	40
Plot 12a	...	1	4 64	Plot 10a	...	0 12	0
Plot 16a	...	1	12 69	Plot 18a	...	1 0	0
Average		1	12 47	Average		1 2	61

The proportionate effectiveness of superphosphate and slag were, therefore, as 13 to 9. The relative prices of the two manures when bought in the cheapest market would, when landed on the farm, be as 13 to 10½. Hence, judged from the first year's effect, superphosphate is the cheaper manure.

As to the effect of bone dust, it will be seen in both Set A and Set B to have been very inferior. As this material cost £7 7s. 9d. per ton landed on the farm, it must be regarded as considerably the least profitable.

The effect of lime is more clearly shown in the plots of Set B than in those

of Set A, for in the latter set there appears to have been an irregularity in the seed in Plots 16 to 22; whereas in the corresponding plots of Set B the seed appears to have been exceedingly regular. Judging from the latter plots both the lime and the gypsum appear to have produced an appreciable improvement, though one which, at the present prices of these materials, would not have been profitable.

The striking effect of manure on this soil was shown also in the plots known as the "cultivation plots," the results of which are given in the following table:

CULTIVATION EXPERIMENTS, CENTRAL EXPERIMENT FARM, 1902-3.

POTATOES, ON HILL SOIL (RED LOAM.)

Variety of Potato: Early Rose.

No. of Plot.	Nature of Treatment.	Yield per Acre.	Estimated Yield Without Manure		Gain due to Manure	
			Tons Cwts. lbs.	Tons Cwts. lbs.	Tons Cwts. lbs.	
1	S. — —	5 100				
2	S.C. —	6 48				
3	S. — M.	2 3 24	7 23	1 16	1	
4	S.C.M.	1 19 52	7 110	1 11	54	
5	— — —	8 84				
6	— — M.	2 2 96	7 16	1 15	80	
7	— C.M.	1 5 40				
8	— C. —	3 104				Seed Doubtful

EXPLANATIONS:

S means subsoiled with subsoil plough, which stirred the subsoil without bringing it to the surface.

C means cultivated with horse hoe while the crop was growing.

M means manured with $1\frac{1}{2}$ cwt. Nitrate of Soda.
 $2\frac{3}{4}$ cwt. Superphosphate.
 $1\frac{1}{2}$ cwt. Potash Chloride. } per acre.

From the above results it will be seen that the main factor to be attended to in successful crop growing on this soil is the manuring. Subsoiling produced absolutely no increase of crop, and surface cultivating seemed to cause a slight decrease. But a manure, of which

the essential constituent was $2\frac{3}{4}$ cwt. per acre of superphosphate, caused practically the same increase of crop as in the manure plots Set A and Set B just discussed, an increase, namely, of 1 ton 16 cwt. per acre.

MAIZE ON HILL AND VLEI SOILS.

Striking as were the results obtained from the potato manure experiments, there were results equally noteworthy from the experiments on maize. There were two large sets and four small sets of

maize manure plots last season. The returns from the large sets are not yet available, but the following tables give the returns from three out of the four small sets:—

MANURE EXPERIMENTS, CENTRAL EXPERIMENTAL FARM, 1902-3.

MAIZE, ON HILL SOIL (RED LOAM).

Set A.—Superphosphate Section.

Variety : Hickory King. Sown, 28th Nov., 1902 ; harvested, 6th June, 1903 ; shelled, 26th June, 1903.

			SHELLED GRAIN. PER ACRE.			STALKS, CORES, AND REFUSE GRAIN. PER ACRE.		
			Total Yield.		Gain due to Manure. lbs.	Total Yield.		Gain due to Manure lbs.
			With Manure. lbs.	Without Manure. lbs.		With Manure. lbs.	Without Manure lbs.	
Border Plot	...	No manure	...	509	...	...	1,420	...
Plot 1	...	N.P.K.m.	1,300	494	806	2,170	1,370	800
" 2	...	No manure	...	479	...	...	1,320	...
" 3	...	N.P.—m.	1,291	448	843	2,040	1,297	743
" 4	...	—P.—m.	1,407	417	990	1,560	1,274	286
" 5	...	No manure	...	386	...	...	1,250	...
" 6	...	—P. m.	1,300	362	938	1,550	1,265	285
Border Plot	...	No manure	...	339	...	...	1,280	...

Set B.—Basic Slag Section.

Variety : Hickory King Sown, 28th Nov., 1902 ; harvested, 6th June, 1903 ; shelled, 26th June, 1903.

Border Plot	...	No manure	...	421	...	...	1,280	...
Plot 1a	...	N.P.K.m.	960	405	555	1,260	1,260	...
" 2a	...	No manure	...	388	...	...	1,240	...
" 3a	...	N.P.—m.	887	400	487	1,080	1,250	(loss 170)
" 4a	...	—P.—m.	813	412	401	1,440	1,260	180
" 5a	...	No manure	...	423	...	...	1,270	...
" 6a	...	—P.—m.	1,061	370	691	1,560	1,220	340
Border Plot	...	No manure	...	317	...	...	1,170	...

EXPLANATIONS :

N means Sulphate of Ammonia.
 N " Nitrate of Soda.
 P " Superphosphate.
 P " Basic Slag.
 K " Potash Chloride.
 m " Medium Dressing.

The Medium Dressings were :—

Sulphate of Ammonia, 170 lbs. per acre.
 Nitrate of Soda ... 224 " "
 Superphosphate ... 300 " "
 Basic Slag ... 300 " "
 Potash Chloride ... 100 " "

The first fact to be noted in the above tables is the poor yield without manure. The soil in its natural state gave an average yield of only 408 lbs., or 2 muids, of shelled grain per acre, and 1,279 lbs., or 11½ cwt., of stalks, cores, and waste grain. But with manure as high a yield as 7 muids of grain and 19½ cwt. of stalks, etc., was obtained. Considering the unfavourable season, 7 muids must be regarded as a very satisfactory yield. The average yield for Natal proper in 1902, which was a favourable season, was only 5 1-3rd muids ; and the average yield of the United States is only 8 1-3rd muids (25 bushels) per acre.

The second fact to be noted is that the best yield of grain resulted from the use of superphosphate alone. Plot 1, in which the superphosphate was mixed with sulphate of ammonia and potash salt, gave a gain due to the manure of 806 lbs. of grain ; Plot 3, on which the superphosphate was mixed with sulphate of ammonia only, gave a gain due to the manure of 843 lbs. ; while Plot 4, on which superphosphate only was given, gave a gain of 990 lbs. In the slag section, however, the mixed manures gave better results than the slag only ; Plot 4a, with slag only, giving a gain due to manure of 401 lbs. ; while 3a, with

slag and nitrate of soda, gave a gain of 487 lbs.; and Plot 1a, with slag, nitrate of soda, and potash salt, resulted in a gain of 555 lbs.

The third fact to be noted is that, whereas the superphosphate by itself gave the highest increase of grain, the highest increase of stalk was obtained with the complete manure, composed of sulphate of ammonia, superphosphate, and potash salt. Plot 1 gave an increased yield of 800 lbs. stalks, cores, and refuse grain; whereas Plot 4, with superphosphate only, gave an increase of only 286 lbs. The complete manure in which basic slag was used, gave, however, an opposite result, there being no gain of stalk with it, whereas there was a small gain where the slag alone was used. These facts should be held in view, when it is intended to grow in this soil maize for green feed or ensilage. It does not however follow, as a matter of course, that the heavier crop obtained from Plot 1 would have been of greater value as fodder than the lighter crop on Plot 4. The total crop on Plot 1 amounted to 3,470 lbs. per acre, whereas the total on Plot 4 amounted to only 2,967 lbs. per acre. On first thought it might appear that the heavier crop on Plot 1 would be more valuable as a fodder crop than the lighter crop on Plot 4. But it is quite within the bounds of possibility that the lighter crop was of more nutritious

quality, and that its total feeding value was equal, if not superior, to that of the heavier. If it were equal in feeding value, then the lighter crop would be the more valuable, inasmuch as it would require less handling and cartage. The quality of the experimental crops on the farm cannot be tested until a chemist is located there.

What would be the profitableness of the manuring? Taking the mean of the two Plots 4 and 6a, to each of which 300 lbs. per acre of ordinary superphosphate was given, and from which there was a mean gain due to manure of 790 lbs. of grain and 313 lbs. of stalks: the grain, reckoned at 15s. a muid, would be worth £2 19s. 4d.; and the stalks, if reckoned at £2 10s. a ton, would be worth 7s.; so that the gain due to the manure would be worth £3 6s. 4d. If concentrated superphosphate of the quality and price mentioned above in connection with the potato manure experiments were used, 120 lbs. would be required, instead of 300 lbs. of the ordinary superphosphate: this would cost 13s. 5d. That is to say, for an outlay of 13s. 5d. in manure, there would be a return of £3 6s. 4d. worth of crop. There are very few business transactions which can produce profits of this sort: it is a profit of 400 per cent.

Turning now to the plots in the vleiland the following results were obtained from one of the sets of plots:—

MANURE EXPERIMENTS, CENTRAL EXPERIMENT FARM, 1902-3

MAIZE, ON RIVER FLAT (VLEI) SOIL (DARK GREY CLAY LOAM)

Set A.—Superphosphate Section.

Variety: 8 Row Yellow. Sown, 1st Dec., 1902; harvested 4th June, 1903; shelled, 27th June, 1903.

				SHELLED GRAIN, PER ACRE.			STALKS, CORES, AND REFUSE GRAIN, PER ACRE.		
				Total Yield.		Gain due to Manure.	Total Yield.		Gain due to Manure.
				With Manure. lbs.	Without Manure. lbs.		With Manure. lbs.	Without Manure. lbs.	
Border Plot	...	No manure	...	...	800	...	...	2,300	...
Plot 1b	...	N.P.K.m.	...	1,087	753	334	2,880	2,170	710
" 2b	...	No manure	...	...	707	...	...	2,020	...
" 3b	...	N.P.m.	...	1,185	674	511	3,190	1,923	1,267
" 4b	...	-P. m.	...	1,075	641	434	2,400	1,826	574
" 5b	...	No manure	...	...	609	...	...	1,730	...
" 6b	...	-P.-m.	...	1,010	704	306	2,380	2,025	355
Border Plot	...	No manure	...	...	800	...	...	2,320	...

EXPLANATIONS:—Same as in Maize on Hill Soil.

Vlei soils in Natal enjoy a good reputation, and no doubt there are many good river flats in this country, just as there are in other countries; but there are poor river flats here as well as elsewhere; and the above results indicate that this vlei soil on the Experiment Farm can scarcely be classed amongst the rich ones. Without manure it gave an average yield of only 729 lbs. ($3\frac{1}{2}$ muids) of grain per acre, and 2,097 lbs. stalks, cores, and refuse grain. The 8-row yellow mealie is not so good a yielder of grain as the Hickory King. Experiments in other parts of the farm showed Hickory King to yield 55 per cent. more grain than 8-Row Yellow. Now, the yield of 8-Row Yellow on Plot 3b was only 1,185 lbs.; if 55 per cent. be added to this it would represent only 1,836 lbs. (9 1-6th muid) per acre; whereas the hill soil, which has a poor reputation, yielded as high as 7 muids in a dry season. The vlei soil will cost a great deal more for draining, breaking up, and sweetening than the hill soil will, and it will always be heavier to work. Evidently the hill soils have advantages which are not to be despised.

It will be seen from the figures in the above table that the vlei soil required manure. The best result was obtained from the mixture of 170 lbs. sulphate of ammonia and 300 lbs. superphosphate given on Plot 3b, which caused an increased yield of 511 lbs. grain and 1,367 lbs. stalks, etc., per acre. The increased grain, at 15s. a muid, would be worth £1 18s. 9d., and the increased straw, at 50s. a ton, would be worth £1 10s. 6d., making a total increase of £3 9s. 3d. worth of crop due to the manure. The manure cost, at last season's prices, £1 8s. 10d. for sulphate of ammonia and 13s. 5d. for 120 lbs. concentrated superphosphate. There would, therefore, have been a profit of 27s. per acre. But sulphate of ammonia at £19 a ton would be too dear, and it would be better economy to supply the necessary nitrogen by means of leguminous crops, which would cost probably 5s. an acre. If that were done, the total cost of manuring would be only 18s. 5d., and the profit would be £2 10s. 10d. per acre.

On Plot 4b, with superphosphate only, the manure caused an increase of 434 lbs. of grain and 574 lbs. straw, etc. This grain would be worth £1 12s. 7d., and the straw, etc., 12s. 10d.; making a total increase of £2 5s. 5d. The cost of 120 lbs. concentrated superphosphate necessary to produce this would be 13s. 5d.; there being thus a profit of £1 12s. per acre.

Thus there can be no doubt at all about the profitableness of manuring on these soils.

As to the relative value of superphosphate and slag, the following figures show this, so far as the experiments on the maize plots are an indication of it:—

		Superphosphate
Plot 4	...	990
Plot 6a	...	691
Plot 4b	...	434
Average		705
		Basic Slag.
Plot 6	...	958
Plot 4a	...	401
Plot 6b	...	306
Average		555

The above figures are in the proportion of about 13 to 10. On the potato plots we found the average proportion to be about 13 to 9. Hence on the average the slag seems to have done a little better with maize than with potatoes. But this result was largely due to Plot 6, on which there is reason to believe the slag was placed under exceptionally favourable conditions. In any case the superphosphate on the maize plots, as well as on the potato plots, was more profitable than the slag at current prices.

"Willow Grange," the well known farm of the late Mr. Griffin was sold recently. The portion known as Willow Grange, containing a large piece of land capable of being irrigated, fetched £3 1s. per acre, and the remaining portion, named Clifton, realized £2 2s. per acre. The first was bought by Mr. T. F. Hindle and the latter by Messrs. C. Oke & Co., Eastcourt.

A Bill to regulate the sale of imported meat in the Cape Colony, of which Dr. Smartt will move the second reading, is directed to compelling butchers to indicate clearly such portion of their stock exposed for sale as may be frozen imported meat. Severe penalties are provided in the case of any butcher who may sell frozen meat as fresh meat.

Report on the Cattle Disease in Southern Rhodesia.

By Professor R. KOCH.

SECOND REPORT.

(From the "Natal Government Gazette.")

In presenting this, my second report, on African Coast Fever, allow me to supplement it by stating that at this stage of our work I cannot furnish what may be looked upon as a complete record of results, but I can only indicate the direction in which our researches are being prosecuted, how they proceed, and at what stage they have arrived. Experiments in African Coast Fever require much longer than Rinderpest experiments. In Rinderpest negative or positive experimental results are forthcoming in every case in from one to two weeks, whereas in African Coast Fever four weeks are necessary, as the incubative period of the disease is still uncertain; and in the case of tick experiments the time taken up is even longer, one or two months being occupied in hatching out the ticks, and one month more elapsing before the experiment can be considered concluded. This brings the total period necessary for tick experiments up to two or three months.

Soon after sending in my first report a series of experiments on healthy animals were inaugurated. For these experiments our animals were drawn from the Plumtree District, in the south or Rhodesia, which is at present free from disease. Our healthy animals were forwarded by rail from Plumtree and detained in Bulawayo, whence they were driven by road to Hillside Camp.

On their arrival there, to prevent any likelihood of accidental infection *en route*, each animal was well sprayed with a 25 per cent. solution of paraffin in water, and then all were placed in buildings enclosed by wire fence surrounding these at a distance of four yards. To prevent any possibility of ticks being harboured within the enclosure, all vegetation and grass has been removed within the fence, and

the cattle are fed upon imported forage brought up from Kimberley, a disease free area. That these precautions are a sufficient protection is shown by the fact that no case of extraneous infection has occurred amongst these animals since they arrived in Bulawayo.

On the arrival of each lot of healthy animals, their blood was submitted to a preliminary microscopical examination. This examination revealed the remarkable fact that the blood of many of them contained the ordinary pear-shaped micro-organism of common Texas Fever or Redwater, indicating that in the Plumtree District ordinary Texas Fever is an endemic disease.

Amongst the first batch of Plumtree animals received, numbering eighteen, pear-shaped organisms were present in no fewer than eight cases, although all the animals were apparently in perfect health, indicating that their infection with the disease was not of recent date, but was of rather long standing. This fact has an important bearing upon the whole investigation, and must be taken into consideration in our further work.

Some experiments made with the blood of these animals which contained the micro-organisms of ordinary redwater, and data furnished me by Chief Veterinary Surgeon Gray, prove conclusively that ordinary Redwater infection has existed along the main transport roads throughout Rhodesia, between Bulawayo and the south, between Bulawayo and Salisbury, and along other trade routes, for a long time, and therefore every ox which has worked along these roads for any lengthy period may be reasonably suspected of harbouring in his blood the organisms of Redwater.

Now we know that animals of this class living in a region where Texas

Fever is endemic, or which have come therefrom, may have relapses of this disease. These relapses are indicated microscopically by the appearance of numerous Texas Fever organisms in their blood, and are most likely to occur if such animals are attacked by any other febrile disorder by which their vitality is lowered, as such a lowering of their vitality gives the Texas Fever organisms a chance to multiply. An experience of this sort is not uncommon in Rinderpest, and it has been found that when an animal immune to Texas Fever and retaining in its blood the organisms of that disease, is attacked by Rinderpest, it may develop not only Rinderpest, but at the same time Texas Fever. Much slighter causes than attacks of a serious disease of this class may induce relapses in specially predisposed animals, which have at some previous time suffered from Redwater, mere elevation of temperature such as may result from overwork sometimes being sufficient.

This being our experience, it might be expected that such predisposed animals which had previously suffered from Redwater might again show symptoms of it if attacked by African Coast Fever, and starting with such an hypothesis a very simple explanation is forthcoming for certain phenomena which have been observed during the present epidemic, such as the presence of large pear-shaped organisms in the blood in certain cases, and the occurrence of haemoglobinuria. These pear-shaped parasites are not found in all cases of African Coast Fever, nor do they appear simultaneously with the bacillary organisms, but they show themselves in the later stages of the disease, while the haemoglobinuria which we have observed occasionally, we have only seen in cases in which the pear-shaped organisms, hitherto considered characteristic of Texas Fever, have been found along with the organisms of the bacillary type.

In all we have examined the blood of ninety-one sick animals. In every instance we have found the small parasites of African Coast Fever, but only in ten cases have we found these parasites in

conjunction with the larger pyriform organisms, and in six of the latter cases we have observed blood-coloured urine.

These observations bear out the view that amongst the animals whose blood we have examined there were a certain number of specially predisposed animals salted to ordinary Redwater which again developed this disease as a result of the high temperature produced by an attack of African Coast Fever.

Evidence in support of this theory can also be adduced from a consideration of the outbreak which carried off the imported Australian cattle. Here we had animals susceptible to, and exposed to, infection both with Redwater and African Coast Fever. Probably some were more susceptible to ordinary Redwater, or probably the incubative period of African Coast Fever is longer than that of Texas Fever, and for one reason or the other Redwater of the usual Colonial type first appeared amongst them, while the "atypical" cases observed later on were probably the result of a predominant infection with African Coast Fever.

The probability that African Coast Fever has a longer incubative period than Texas Fever, and the occurrence of cases in which the organisms of African Coast Fever and of ordinary Redwater co-exist in the blood of certain animals, offers an explanation for the apparently positive results obtained by certain artificial infection experiments, which seemed to point to ordinary Redwater as the sole cause of the present outbreak, as if blood for inoculation was taken from an animal suffering from two diseases, one of which has a shorter incubative period than the other, the disease with the short incubative period will be the first to declare itself, and if the reaction produced is one with characteristic peculiarities, the outcome of such an inoculation experiment may be most misleading.

When we began our experiments upon healthy animals we expected to be able to produce the disease without difficulty by subcutaneous inoculation with blood taken from sick animals, an easy matter in ordinary Texas Fever in which the in-

jection of 5 c.c. virulent blood almost always induces a severe and frequently a fatal attack, and as we understood inoculation with virulent blood in African Coast Fever had had a like effect, our surprise was the greater when we found that such inoculations were ineffective when we injected subcutaneously blood containing an abundance of the smaller parasites. As it was important to establish beyond dispute that such inoculations do not communicate the disease, many experiments were made with varying doses of blood, and in various ways. Instead of using defibrinated blood, as we did at first, warm fresh blood drawn directly from the jugular vein was tried, injections being made subcutaneously, directly into a vein, and into the peritoneal cavity. In some cases the injected blood was mixed with an emulsion of spleen pulp and of lymphatic gland, as these organs contain large numbers of multiplication forms of the parasite, as I have mentioned in my first report. In others virulent blood in large volume was injected, doses of 2,000 c.c. being introduced subcutaneously, and 500 c.c. intravenously, but by none of these methods did we succeed in producing the disease. None of the inoculated animals became sick, nor could the parasites be discovered microscopically in their blood. Even in those cases in which blood containing innumerable parasites was injected directly into the vein we were unable to find a single parasite the following day.

All our experiments, and they were many, indicate that the direct inoculation of healthy susceptible animals with the blood of animals suffering from African Coast Fever will not reproduce the disease, and this remarkable fact separates still further African Coast Fever and Texas Fever. In the one case no result follows blood inoculation, while inoculation with blood from the less fatal Texas Fever is attended by most serious results.

Although such inoculations in African Coast Fever fail to communicate the disease, they are nevertheless not without effect. Inoculated animals do not become sick and parasites are absent from

their blood, but when these animals are subjected to a second inoculation with virulent blood the result of the second inoculation differs from that of the first, as we have observed that while the first injection of virulent blood produces either an insignificant rise of temperature on the two following days, or no rise at all, after the second inoculation a temperature reaction follows immediately, which persists for one or two days, and which we may look upon as arising from the inoculation. But what is still more important after an incubative period of from ten to twelve days, a mild attack of African Coast Fever supervenes, characterised by the appearance of the usual small parasites in the blood, and generally by a temperature rise of some days' duration. In the course of twenty-one experiments we have succeeded in ten instances in producing a mild attack of the disease, which clearly shows that such a result is not accidental, and we have now to determine which is the most certain method of producing this mild attack, what doses of virulent blood should be given, and what interval should elapse between the doses in order to be certain of inducing such an attack in every instance. Whether the incidence of such a mild attack confers any immunity I cannot say at present, but a consideration of the effect upon the animal organism produced by mild artificially induced attacks of other infectious diseases, leads me to think that some degree of immunity may result.

How great this immunity may be we will only be able to state when we have discovered a certain method of artificially reproducing the disease in the virulent form which it assumes when arising from veld infection, and this is another problem which has not yet been solved, although I hope we will overcome this difficulty either by a modification of some method of direct infection with virulent blood, or by working indirectly on the lines in which natural infection occurs, through the medium of the tick.

With this object in view, and for the purpose of ascertaining with certainty what tick may be responsible for the

spread of this disease, numerous tick infection experiments have been initiated. Young ticks of all suspected species are being hatched from eggs laid by mature females taken from sick animals, and many have been placed upon healthy susceptible animals, but these experiments have not reached that stage at which we may expect to get conclusive results, tick infection experiments, as I have already remarked, being particularly tedious, and taking up much time.

Concurrently with this work we are conducting experiments with a view to obtaining a curative serum. At first I intended to prepare an anti-toxic serum which would tend to neutralise the toxic products of the organism. For such a purpose the animal whose serum it is proposed to use is inoculated with gradually increased doses of virulent blood, and, working on these lines, we have now several animals which are highly fortified, but since we have discovered that healthy animals are also able to resist large doses of virulent blood, I have also decided to prepare animals by inoculation with successive large doses of virulent blood for the purpose of obtaining a cytolytic serum. Such a serum possesses the property of directly attacking the specific parasite instead of neutralising its products as an anti-toxic serum would do, and we have now a number of animals fortified for producing such a cytolytic serum, but more time is required in order to enable us to produce a sufficiently powerful serum of this class for our experiments.

For the production of anti-toxic and cytolytic serum only immune animals can be used, as susceptible animals tend to break down under repeated injections of virulent blood, and for our work the immune animals taken over from the Transport Department, Salisbury, which survived the outbreak there, and which have since been grazed continually on infected veld, have been most valuable. Of their immunity I think there can be little doubt, as none of them have shown any signs of indisposition after repeated injections with large doses of highly infected blood.

Our experience with the animals which we found here on our arrival has been

less satisfactory. These animals, lent by Bulawayo farmers many months ago, had been subjected, previous to our arrival, to a series of inoculations, beginning with recovered and finishing with virulent blood, with a view to conferring immunity on somewhat similar lines to those by which animals are immunised against ordinary Texas Fever. Most had been turned out on the commonage for exposure to natural infection after the final inoculation, and on examination of their blood on our arrival revealed the presence of a few small parasites, which I stated in my first report led me to believe they might be immune, but this unfortunately is not the case, as several (13 out of 29) have since developed acute attacks of African Coast Fever and died. From this we must conclude that the discovery of single small parasites in the blood of cattle exposed to infection with African Coast Fever only proves that these animals have come in contact with some infecting agency, but does not indicate that they are capable of resisting further infection, as we previously supposed. Herein lies another point of difference between African Coast Fever and Texas Fever, as the discovery of isolated pyriform organisms in the blood of animals which have been infected with Texas Fever can generally be considered to indicate that under ordinary circumstances such animals will resist further infection with this disease, a conclusion unwarranted in dealing with African Coast Fever when we detect the presence of isolated organisms in the blood of apparently healthy animals.

The presence of such small parasites in every case in which they are found can be taken, I believe, as a proof of the cattle whose blood contains them, certainly come from areas where African Coast Fever infection exists. All our investigations on this point bear out such an assumption. Single parasites have been found in the blood of forty animals which have come from the infected areas of Salisbury and Bulawayo, while no such parasites have been found in thirty blood preparations sent from the Cape Peninsula, an area free from both Texas Fever and African

Coast Fever. For the specimens sent from Capetown I am indebted to Dr. Hutcheon, Colonial Veterinary Surgeon, who kindly arranged to have them forwarded to Bulawayo. In the blood of sixty-four animals from the clean district of Plumtree no such single parasites have been demonstrated, nor did an examination of blood preparations of other twenty-four animals, taken in the same district, reveal their presence, while it is particularly interesting to note that in the blood of seven animals brought from Beira and of the six brought from Dar-es-Salaam (German East Africa) for the purpose of testing their immunity, we found the same small parasites which were present in our local animals.

For the preparation of animals in order to obtain anti-toxic and cytolytic serums, much virulent blood was necessary, and at first its scarcity somewhat retarded our work, but latterly, thanks

to the efforts of Mr. Marshall Hole, Civil Commissioner; Mr. Taylor, Chief Native Commissioner; and Mr. Gray, Chief Veterinary Surgeon, to the liberality of certain farmers in the Bulawayo District, and to the energy of Messrs. Fynn and McDonald in charge of the Fingo Location, Bembesi, who have sent in large numbers of sick cattle, contributed by the Fingoes, we have had no difficulty in carrying out this part of our work.

In all 78 sick animals have been obtained which have been of material service, enabling us to carry out a systematic observation of animals while sick, to obtain virulent blood for fortification purposes while they lived, while such as died furnished valuable material for careful *post-mortem* examinations.

R. KOCH.

Bulawayo, Rhodesia,
28th May, 1903.

The Grading of Dairy Cattle.

By GEO. D. ALEXANDER, P. D. SIMMONS, and WM. WOODS: Conclusions by E. O. CHALLIS, Government Dairy Expert.

SOME time ago Messrs. Gray and Harrison, of Doornpoort, Elandslaagte, wrote to the Director of Agriculture asking for information on the grading of cattle for the dairy. They further suggested that the information would be generally acceptable to the readers of the *Journal*. In response, at the request of the Director of Agriculture, Mr. E. O. Challis wrote to Messrs. Wm. Woods, P. D. Simmons, and Geo. D. Alexander asking them respectively for their views on the subject. In the next issue Mr. Challis will review the articles and give his own conclusions.

By GEO. D. ALEXANDER, Meyer's Hoek, Natal.

I have been asked to give my ideas on how to grade up a herd of cattle for dairying purposes from common stock.

There are two methods, the one by the introduction of pure blood from

established dairying breeds, and selection of the fittest of the cattle for dairying purposes and careful breeding from and management of these. The other, selection of the fittest and management only. The first method is much the quicker, but, unfortunately, owing to the presence of Redwater in this country, to advocate the adoption of this method is something like giving a French cookery book to a bachelor on the back veld, who, on going to make use of some recipe, finds the book says: Take two truffles, a pint of champagne, the breast of a pheasant, and a pint of clear stock, and several other ingredients; while all he has at hand is half a pound of baking powder and some flour.

Perhaps to say there are two methods is hardly correct; the method and its application are the same, only the one is like doing a journey by express train, while the other means you have to walk the whole distance.

On the question of which is the breed of cattle for dairying purposes I do not intend to enter in this article. Owing to Redwater it is almost impossible to import pure-bred sires and dams, and very few Colonial pure breeds are available. The question of the best breed is a vexed one, each having its own supporters. Shorthorn, Devon, Kerry, Friesland, and Ayrshire, are all good milking breeds, and one of these breeds might do well where the other breeds might not. The objection raised to the Shorthorn, because it grew a long coat, which harboured ticks, and therefore did not thrive well, will disappear where cattle dipping is adopted. I have seen some very fine milk cattle resulting from a cross between Kerry and Shorthorn.

Most of the celebrated breeds, now stamped with a fixity, and established characteristics, are the result of selection of the fittest. The selection and steady use of the best of even common stock will lead to improvement. The cow is a machine, producing results according to the care and feed given. The individuality of a cow, so far as her profitability is concerned, counts for more than either breed or breeding; many profitable cows have no recorded grand parents. A cow's profitability depends upon the quantity of her milk, the quality of her milk, the length of period she will yield milk before she goes dry, and what it costs in food to produce the milk.

In grading up a herd of common cattle for dairying purposes, the owner should remember that like begets like, that the influence of the sire is said to be more than half, that a milk cow is very often made or spoilt when she has her first calf, that proper feeding is absolutely essential, and good management indispensable. Some stock owners are content to get a bull "with a pedigree," and let it run in their herds, and do not milk their cows, with the firm impression that the result will be they will soon have a herd of milkers. If the bull has taken a prize at a local show any doubt becomes an absolute certainty. The management of the heifers and training them to milk and proper feeding are considered quite

unnecessary. But "the pedigree's but the guinea stamp, a milk cow's a milk cow for a' that."

I had under my observation some years ago two imported stud Shorthorn bulls, both magnificent animals, and with pedigrees beyond reproach; both threw nice looking stock. The heifers from one of these were splendid milkers, those from the other (whose appearance was preferred by many) gave very little milk but carried a splendid carcass. Both sires were put to the same class of cow.

If a stock farmer wishes to improve his milking herd, going steadily up the ladder to get as near as possible to the top step marked "perfection," he must be prepared to undertake the business thoroughly, and spend time and care over it, if not let him leave the rearing of milkers to someone else. There is a disease known as "trouble," and it seems to be more feared by some than the plague: they are always afraid of catching it. They don't want to take the trouble to milk twice daily, to make butter, or to send to the creameries, to test their cows' milking capacity, to weigh the food, or supervise the feeding, to hand-rear calves, etc., etc. Let us suppose, however, that the man who wishes to grade up his cattle has 50 cows and a supreme contempt for "the trouble." I would suggest that to start with he takes a note when each of his cows calve, and say a fortnight after she calves, weigh the quantity of milk he gets from her per day for two or three days and take the average (a cow after calving usually increases in yield up to the end of the sixth or seventh week, when she begins to decrease). If she is in the period of her second milking, or has passed it, and gives only a small quantity of milk, and dries off after a limited period, let him get rid of her. There is a temptation when a cow remains in a troop of milkers, when she has a heifer calf, to let this remain, with the idea of trying her when her time comes, but it is not worth the time and feed. Like begets like, I have said above if she is in her second period. Sometimes a young heifer with her first calf has a

very poor show of milk, but by carefully educating her and draining the last drop from her udder each milking, and continuing to milk her even when the milk gained did not seem to compensate for the labour and food, such a heifer may become a good milker when she calves again. I remember one case in particular where a heifer had almost no milk with her first calf, but when she calved again she surpassed all the other cows in the troop.

Say out of the fifty head which were taken as an illustration it is found that fifteen or twenty show promise of milking well, let every attention be given to these, and good feeding, and let the owner get the best young bull he can get. It is no economy to get an inferior bull because it is cheap. The influence of the sire is more than half, according to the experience of dairy cattle breeders in England, and if the bull is an inferior one the result will be to grade down instead of grading up. If possible the dam should be seen, and some of the heifers bred from the same sire, and it is further desirable to see those milked; failing this the intending purchaser should take every means he can to find out the milking qualities of the dam and of the parents of the sire of the bull he thinks of buying before concluding the bargain. A careful search for a good young bull from milking stock, and a determination not to be deterred from purchasing because of a few pounds in his price, will amply repay if the bull is from milking strains on both sides. It is much better to get a bull two or three years old than an older one. Later on bull calves bred from the best milkers in the herd should be given special attention and feeding with a view to their use in the herd. The cows rejected out of the fifty head as not being up to standard should be disposed of, and some young cows purchased with the proceeds to go through the same process of testing by weighing the milk, and noting the time the cow continues to milk.

I think it is a great mistake to allow unprofitable cows to remain in the milking herd; they breed, and the heifers grow into cows, and the number in-

creases; the food bill also increases, and the cows are probably cut down in their rations all round on the ground of expense. The good milkers have to pay for the keep of the poor milkers before any profit is shown. It would pay better to keep the good milkers only and give them the extra food consumed and wasted by the inferior animals. It is better to keep a few cows and feed them well than to keep a number and underfeed them. By continuing on the lines indicated it will be found that after a few years the class of cows that were originally selected as the best can be culled out and a higher standard fixed, as the herd gradually improves in milking qualities. If the owner can weigh his milk supply daily, and compare the yearly average per cow, it will be of use and interest to him to note his advance. If this is not feasible let him weigh it once a week (avoiding a cold day), and take the weight as the average for the week. The proper feeding of dairy cows is of the utmost importance (see Feeding of Dairy Cattle), and dairy farmers should devote study to this part of the management, and try practical experiments in feeding with differently compounded rations until they obtain the best results with economy. Another matter of first importance in grading up a dairy herd is the teaching to milk and the treatment to heifers. A heifer may possess a capacity for milk production, but it rests with the owner to develop to its fullest this capacity. The heifer may inherit milking qualities, but these are of a potential nature, which want of development may ruin.

I am strongly of the opinion that to develop the milking capacity of the cow it is necessary to take away the calf and rear it by hand. I do not think the practice of letting the calf suck the cow is to be found in use in any successful dairying country. There is a saying amongst dairy farmers: To spoil a good cow and make a good calf, allow the one to be sucked by the other. I have already said what I think on the subject in a former paper on the "Rearing of Calves," but I would like to quote the following extract from an article by Professor

Freer Thonger, M.R.A.C., F.C.S., Professor of Agriculture of the Colonial College, Holesley Bay, entitled
INJURY TO COWS BY ALLOWING CALVES
TO SUCK.

"Nothing is more injurious to the cow than allowing the calf to suck. The injury is more or less permanent, according to the length of time it is continued, and doubtless depends largely upon the vigour and digestive powers of the calf, and the quantity of milk given by the cow.

"The udder of a young cow thus treated in the full flush of her yield loses capacity to hold a large 'mess' of milk, if ever it had it; the older cows, becoming accustomed to the steady half-hourly drafts of the calf, fall off in their yield rapidly after the calf has been sent to market (or begins to fend for itself). Calves, it is true, fatten better on the cow, but I am not sure that a calf cannot be just as well off as 'on the cow.'

"When a deep milking cow has two calves put upon her their thrift will often indicate an enormous milk secretion. I presume no harm comes from this practice commenced after a cow is four or five years old, but thousands of good heifers are spoilt every year because, not being pleasant to milk, their calves are left to run with them. Their udders never become distended, they lack capacity to carry their milk from one milking to another, and, when their calves are taken away, not only do their teats leak, but the discomfort caused by the unusual distension of the udder results in a decreasing yield; whereas had the distension occurred when the whole system was in the plastic condition in which it is just after calving, when the udder is naturally swollen and more or less painful, it would have become for life adapted to the circumstances, and would be of increasing capacity. The reason why wild cows give so small a quantity of milk is that their calves run with them.

"It seems folly for farmers who want milk to follow the course which they see in nature produces just the result they do not want. . . . In cows, of course, the decrease of milk is not observed until

the system of milking twice a day is adopted. So long as the calf takes its own rations, as soon as it can digest what it takes, the flow keeps up, but it renders the cow more or less incapable of carrying the milk produced, and of producing more than she can comfortably carry. The desirability, therefore, of removing the calf from the cow is apparent. It is, in fact, demanded by every motive of economy. . . ."

Milking comes of milking, and to make a good milker the milking function must be developed early; the udder should be stripped to the very last drop in order to establish the milking habit. To teach this habit, the heifer should be persistently milked, even if the quantity given is only a cupful, and may not seem worth the labour. Some authorities on dairying matters recommend keeping the heifer from the bull for six months after her calving, and milking her for fourteen months to establish the habit of milking.

By Wm. Woods, Mooi River, Natal.

The information required by cattle breeders is, what sort of beast is wanted, and how to get it. I have been trying in this country for over forty years to get a hardy animal, useful in the yoke for farm work, a fair milker on the veld, and with quality enough to yield a good profit in milk when fed to it. To deal with that great and only stand-by of the amateur, pedigree, I think an inch of performance is worth a yard of pedigree. A bad beast damns his ancestors, even if they go back to the Bull of Bashan. Some animals, no matter what their pedigree may be, are not capable of producing stout, healthy stock, and if it were not that their pedigree gives them a fictitious value, would never be kept for breeding. This weakness is perpetuated, as their pedigree makes them too valuable to destroy. Again, pedigree usually indicates that the animal has been artificially fed and forced for many generations, which will lead, in most instances, to disappointment.

I like to get a bull calf from a good milk cow, but even that requires judgment, if the cow has been running and

not been fed. If the cow gives 1 to 1½ gallons at a milking when the calf is three months old, it proves more to me than if the mother gave 3 gallons at a milking when fed on bran, corn, and succulent food of the best, kept in a stable, groomed and quietly handled every day. I usually buy four or five bull calves of the type I breed for and keep them a year or two, and do not expect them to be too good looking as two and three year olds. I do not, and never have, bought imported bulls; the way they are fed and done in England gives no guarantee as to how their stock will do under less favourable circumstances.

As to the best breed of cattle, some districts will hold a better class of cattle than others. When I came to Natal over forty years ago I found in the sweet and half thorn veld the herds of Mr. Peterson, on the banks of the Tugela; Mr. Uys (Cripple Cose), Biggarsberg; James Grey, Klip River; and here, Stoppel Lotter, Weenen County. All these men had grand milking herds, large black and white, and dun and white heavy oxen and cows, with deep udders and large teats. Such cattle are not to be found now; how is their disappearance to be accounted for? The furor of transport riding, which was found to pay better than milking, and the gradual drying up of the sweet veld country, with the curtailment of the runs which closer occupation brought about provide the explanation. What the farmer wants to know is how to produce and sustain such herds under present conditions. The cattle I have just mentioned were mostly of the Friesland breed, brought originally from the Cape Colony overland. I do not profess to know much of the Friesland cattle, although I have seen, Greytown way, some very nice pure bred and useful crosses with the Zulu.

What I favour for a general purpose animal is a cross from a compact dark red Shorthorn, thick through the heart, good loin (one main point in any bull), a curly head, and small forward horns, head carried rather high—I do not like his nose poking to the ground—good thighs—I do not care so much for a fashionable high tail bone—with a Zulu

cow, dark brown, yellow nose and inside the ears and about the udder; this should be a hardy animal, while indicating rich milk. The first cross with these throws a splendid useful beast, but the job is to keep it up. When you begin inter-crossing I can only advise making a study of it to suit your own requirements, and not be disheartened by failure nor listen to everyone's advice, nor take for gospel all you see in print. Do not expect to get an animal that will milk well on poor indigestible food and carry flesh all the year round to mature early and live long; you must be guided by the nature of your country, and even by your particular farm. I stick to the Shorthorn cross, as I see by the milking records at Home that the Shorthorn and Shorthorn grade cows are always in the first three, and more often than not first sharing honours with Ayrshire and Channel Island cattle. Devons and Herefords are never mentioned. The Shorthorn should be heavy and as hardy as any other English breed, as they are to be found in every part of England and Scotland. There is no doubt some few years ago the Shorthorn was coddled and fed up for show and to supply the great demand for export for bulls, with the result that a number of bad ones were kept that should have been made veal of; and that is, or will be, the case with the Devon or any other breed when that breed comes to fashion and demand. The standard of excellence is kept up in England by the slaughter of 90 per cent. of bull calves and fully 50 per cent. of heifer calves for veal, leaving only the very pick to breed from. We have not the same chance here; every heifer is kept, and if a man breeds bulls for sale he can dispose of the last one, when really perhaps only one or two, or even in some years, not one is fit to improve his stock. To me the Africander cattle do not please the eye, and I cannot be persuaded that a coarse head, heavy horns, no girth behind the shoulder, slack back and drooping rump can be to the advantage of any animal. Mr. Smith, the Dairy Expert in the Orange River Colony, says they are good milkers at grass, and I know they have a good thick

hide on them, but I feel sure they could be vastly improved by crossing with a real good Shorthorn bull. After that, selecting for a few years the shape might be improved without affecting their utility; though I know of several successful breeders (my neighbour, Mr. F. Culverwell, for one) who prefer to stick to well-selected Africander bulls, but he treks long distances with his cattle at different times of the year. I suppose there must be some attributes in the Africander that makes up for its unshapely appearance; probably if you tried to breed a camel with a straight back he would lose some of his valuable properties in so doing. They require a big range of country, and I doubt their doing in our small paddocks as well as the more domesticated breeds. I should say it would be a mistake to try to grow big cattle below Howick—Zulu, Channel Island, and Kerry cross are there the best; the Ayrshire is a very good and useful beast, but I believe it is better to breed than to import such a beast, the climate being so different to their native Scotland. A cross between a Shorthorn and Zulu makes a very fair Ayrshire.

I have presumed to write this article as I am told on all sides that I have been fairly successful in keeping up a useful and even type of cattle on a very hard farm, and at no great outlay for the bulls or cows. There is no secret in it, I have always used a half-bred Shorthorn bull, beginning with Zulu cows. I wean the calves born before Christmas in April, feed the cattle on hay, and those I milk on roots with a little corn in the winter. I send my cream to the creamery, but I do not sacrifice the calf for the sake of the milk. If I see a calf doing badly, or a heifer with her first calf looking thin, I turn them out. I am losing more cattle from redwater or gallsickness than I used to do, but I do not think the breed or the milking or the pasture has much to do with that.

By PERCY D. SIMMONS, Mooi River,
Natal.

I have accepted the invitation of Mr. E. O. Challis to attempt to give a few

lines on the grading up of cattle in this country. It is a very old theme and a little difficult, but every country has its peculiarities. Old practical personal experience can bring one to a conclusion on the subject, and that necessarily more conclusive if the outcome of some years' experimenting. To me it has always been one of great pleasure watching the results of crossing and grading, and I will give for what they are worth my experiences and conclusions arrived at after some sixteen years' experience.

I commenced in a very small way early in 1887, being then a tenant of this property, with very little capital. I had been a farm pupil previous to that year, and had during that time watched the various herds of cattle in many parts of Weenen County. From observation and enquiry I came to think, before I had been one year in Natal, that it was poor policy to breed in the happy-go-lucky style that then generally prevailed, and by visiting the herds that had been improved to a certain extent I soon saw my future depended greatly on my grading up or improving the foundation stock of the country. I started cattle farming by expending the sum of £45, if my memory serves me rightly. Anyhow, I bought a few cows at £5 apiece and one at £15; this cow had already two crosses of Shorthorn blood in her veins. On my reporting my purchase to the gentleman with whom I had been learning farming I got a rating, and was told I should have bought three at £5 in the place of the one at £15, and I expect nineteen out of every twenty farmers would have given me the same advice in those days. Well, the £5 cows did not break me, while they also made very little for me, but the £15 cow, judiciously mated with the best Shorthorn bulls then available at stud in Natal, brought me a small fortune in herself. I sold her first calf to an Englishman for £10, her next for £15, and her third to a Dutchman for £25; her fourth at the Durban show, a heifer with her first calf (calf held back), for 45 guineas; her fifth for £35; her sixth for £30. From the fourth, fifth, and sixth I kept their calves before selling them as milkers. Her seventh I sold

for £25—a bull calf—and his purchaser is at my elbow as I write, and he tells me he sold him at nine years of age for £30. From the progeny I kept I have now built up a little herd of splendid constitutioned cattle, and the females are all good milkers, commanding the best of prices as milk cows. I sold this original cow when old for 15 guineas as a milker, and she gave satisfaction.

With this encouragement, which I don't think now-a-days would prove a very exceptional case, I have profited, and it has been my maxim ever since to grade and improve. Since those days I have purchased pretty well every description of cow obtainable in this Colony, and also from the late Free State. I have bought Zulu cows, Afrianders, Natal native cows, and ordinary so-called Dutch cattle, and I have always crossed with Shorthorns since the first year or two of my farming operations. On the Zulu cow foundation, mated with pure Shorthorn, I found the most marked improvements from the first cross; the second cross may not always come up to expectations, but if you put the second cross with the original stock you then see the enormous marked improvement. One great and most marked improvement is perhaps the temperament of the cattle, they are tractable and pleasant to work with, while the original stock are wild, nervous, and consequently unpleasant to farm. With stock graded up one finds that they respond much quicker to feed and attention, and now that dairying is one of the features, or should be, of every farm within reach of a railway, one gets the benefit in full.

I have used grade bulls and though the results are naturally not so marked as from pure-bred sires, it is practicable and profitable, and a vast improvement on the old stock. We have instances of farmers and a good many who have never purchased a pedigree or pure-bred bull to put in their herds, but have only selected grade bulls for their use, and have built up herds little behind those who have used only pure-bred bulls. I know of several herds, and notably of two in our county, which are

much in advance in every respect of others in which only ordinary bulls, or perhaps bulls with one or two pure crosses in their veins, have run. The breeders of these herds command much better prices for their stock than their neighbours, and are able to sell the oxen at three years old and command as good a price as those of their neighbours selling theirs when five and six years of age. Perhaps the greatest profits comes through the graded cows, which always command double the price that the ordinary cow of the country fetches.

I have been twitted with the remark, "I hear you have lost another good bull or beast," and my reply invariably now is, "Yes, you hear of the loss of a good beast, but fifty ordinary ones may die and you hear nothing of it." I find grade cattle every bit as hardy as the old and ordinary beast of the country, and as rustlers in hard times I think they compare very favourably. My herds contain all grades, from the pure bred to the commonest, as I have not yet given up the pleasure of experimenting. I still winter cattle both in the Thorns and in the Berg, and I find losses from wintering practically nil. Natives lose in the winter a far greater number of cattle, and use nearly the same winter grazing. From my experience, I advise every farmer to grade his stock up, and I am convinced he will never regret it; it is only a matter of time, and few, if any, farmers will stand stagnant with their herds. When I mention that I have sold young graded heifers at £50 each, not one, but dozens, and only lately I sold a truck load of two year olds at £35 each, readers will recognise that it is not only a real pleasure to improve but also thoroughly profitable. I attach a cutting from the *Farmers' Magazine* of 1893, ten years ago, and I think it well worth reproducing, as it will show even then the grading system was well recognised. For farm work I am quite convinced that a good large graded ox is worth a lot more than an ordinary ox.

A rather amusing incident happened here during the War. A refugee Free State farmer who stayed here with his

wagons and oxen read me a lecture about the ox of the country and his advantage over a better bred beast. He carried wattle poles from here, and first borrowed some of my cross-bred Short-horn oxen, then purchased a pair, and as I wanted oxen for special work I repurchased these oxen from him. In a few days he came to me and said he must have these oxen back, as he found his oxen could not pull the loads. I let him have some, and he is now one of the converted ones, finding weight necessary to shift good loads. I have had no experience on the roads, but the attached communication of 1893 says something on this subject I see.

In conclusion, I would offer one word

more of advice. If intending improvers of their stock mean to import, let them be warned that many a bad beast is palmed off on the Colonists, and let them be very careful that they employ the right agent at Home or they may get landed, as a breeder in the Cape Colony was some years ago. He purchased a bull for £155 landed there that only cost £17 at Home. He was sold for this sum there (at Home) because he could not be got fat enough for a butcher to buy, being one of those big, loose broadhipped angular brutes without any constitution that are sold as being of great milking strains—only an excuse for his mean miserable condition.

The Natal Victoria Orange.

ZULULAND.

Interview with Mr. DAVID BROWN, J.P.

IT recently occurred to me that the great orange discovered or evolved by Mr. David Brown was deserving of further prominence than it has received, and accordingly by arrangement I went to see it *in situ* and interview its author. The orange was first introduced to the public by Mr. J. L. Knight, the Magistrate at Verulam, whose periodical reports to the *Journal*, as all readers know, are of exceptional interest. In his District Report, appearing in No. 11, Vol. IV., he spoke with unstinted enthusiasm about the orange. Mr. Brown, who is constitutionally averse to publicity, desired Mr. Knight not to mention his name, but in the course of a few months he had received letters of enquiry, through the courtesy of the Magistrate, from all parts of the world—from India, Florida, Barbadoes, Jamaica, and elsewhere. How exceptional in size is the orange, will be readily seen by the photograph which depicts one of 15 inches in girth standing close by a tin of imported milk—a most familiar object, unfortunately, of standard size to every colonist. Fifteen inches, however, is not the top girth, for growing on a tree I saw with my own eyes one that took

fully 16 inches of a tape measure. The reputation of the orange having brought demands for Victoria plants from far and near, Mr. Brown disclosed his identity, and resolved to turn to profit what had been the outcome of merely pleasure or amusement. I shall now give the story of the orange in Mr. Brown's own words.

"Yes," he said, "from my youth up I have been interested in cross fertilization, and about sixteen years ago I made a great many experiments among plants on methods, which, so far as I know, were peculiarly my own. A good many of these verandah *heronias* are hybrids. Cross fertilization becomes a fascinating ploy. I don't want to go into the way the orange was originated; I think for my pecuniary interest it is best to keep it back for the present. Before very long, however, it will be made public."

"Well, about the habit and growth?"

"The tree is the strongest and most vigorous growing I know. The leaves are a handsome rich dark green, somewhat round, very large, glossy, thick, puckered in the middle, and resembling those of no other orange tree. Apart from the fruit, the tree is decidedly

ornamental. It is a very heavy cropper, and stands the drought exceptionally well. The flowering and ripening stages are at the usual time. The tree is in full bearing four years after grafting."

Most of these points I can confirm, especially the drought-resistant properties of the tree. Other orange trees, stricken with drought, were presenting a forlorn appearance, many of the leaves showing to the front the insides instead of the surface.

"And about the fruit?"

"The fruit is, as you know it, very large, juicy, and of good flavour."

"I quite agree, but is not the rind a little thick?"

"The skin is certainly not of the mandarin type, but for the ordinary orange I don't think it can be considered exceptionally thick, and the older the tree and the riper the fruit the thinner is the skin."

"And as to its keeping qualities?"

"They are excellent. The oranges will keep good in the house for seven or eight weeks. I feel sure they would be splendid for shipping; they stand rough usage. In good seasons they will remain on the trees three or four months after being dead ripe. A considerable number are seedless. This season has been bad in all respects—drought and the fearful heat of 25th January last, which was accompanied by a hot wind. The temperature on that day rose to 116—poultry, bush birds, bats were killed, and all sorts of plants were shrivelled up. Until this year the fruit was never fly pricked: according to the season the other citrus fruit is yearly attacked, but the Victoria proved resistant till this season."

"What do you graft on?"

"Lemon and the Seville orange chiefly, for they are the hardiest stocks. The ordinary orange seedling is also good, but this stock is somewhat liable to foot rot, particularly if planted on a clay or unfavourable subsoil."

"Do you approve of seedlings?"

"Of course seedlings cannot be relied on to produce the same as the parent tree, but the few young ones I have bear

close resemblance in the growth and foliage."

"You have very little scale, I notice."

"Yes; not much. In the winter I give a couple of sprayings at an interval of about ten days. A neighbour recommended me to use Quibell's sheep dip, 1 of dip to 90 of water, and I find it simple, effective and cheap."

The pictures which accompany this article will assist in conveying an impression of the size and character of the fruit and the tree. Of course the top size measurements and weights of 16 inches in circumference and 28 oz. in weight will by no means apply to all the fruits of a tree, and no orange grower would expect such evenness, but about the general great size and the goodness of the inside of the Natal Victoria orange there is no doubt whatever."

COFFEE BORER.

While in the orchard I noticed a coffee tree with a hole about a couple of inches above the ground. The hole looked as if it had been made by a Lee-Metford bullet. Mr. Brown explained that it was made by the borer, about which the coffee growers of the early days speak so much, and as he is a keen student of nature I asked him to give me a description of the borer and its doings. "Firstly," he said, "the beetle comes. She is handsome and about 1½ inches long, and she lays her eggs—from three to six—about an inch and a half up the stem, and punctures the bark where each egg is deposited. The eggs she covers with some gluey substance. In about a week life commences, and the resulting maggots work their way downwards, and for eighteen months or two years live on the tender skin of the roots. But not all of the roots: the clever creatures leave one root untouched, that being sufficient to enable the tree to exist. They then bore up the stem and make the hole outwards that you noticed, and emerge as beetles—generally in the month of December. That tree you saw, in spite of its greenness, is done for—you could easily pull it up with a couple of fingers. No; they never lay their eggs on a tree which has once supported a family of

horers; they are too wise. We tried tarring at one time. That did not stop them; adapting themselves to the new conditions, they deposited their eggs just below the band of tar. They are as wise as they are destructive."

ZULULAND.

Mr. Brown has travelled much in Zululand, and but few, if any, know the country better than he does. After some hesitation he consented to give me his views of Zululand as an agricultural country. These views I may straightaway observe were not enthusiastic. Like most other colonists, I was under the impression that Zululand had enormous quantities of land fit for sugar, but Mr. Brown holds that that impression is an illusion. "Sugar land," he said, "begins about four miles beyond the Tugela, and goes as far as the Amatikulu, say about 16,000 acres. Then there is no more till you get to the Umhlatusi, excepting odd patches here and there. By sugar land I mean land that will grow sugar without manure. Then at the Inseleni there is a block of a few thousand acres. Excepting odd patches again, there is no more till the Umvolosi Valley, where about 20,000 acres of magnificent land is to be found. Still going northward, say at about ten miles beyond the present terminus of the railway where the Hlabisa coalfields are situated, there begins an enormous block of first-class sugar land, going right up to the Umkuzi. Beyond, all the soil is poor. With the exception of the land south of the Umhlatusi, all is fever country, and could only be occupied by Europeans for a portion of each year. Continuous occupation would be impossible. The land in Zululand available for tea growing is practically unlimited. Near the Umvolosi there is a patch of about 50 acres of fine yellow wood trees. This little forest is at a distance of only ten miles from the sea, and is only about 100 feet above sea level. These conditions, I imagine, are rather unusual for the yellow-wood tree. The forest is called the Mangwa."

FEVER.

"Fever country starts from the Umhlatusi and goes right up to the northern boundary and beyond. From the sea the average breadth of this country will be about thirty-five miles."

"What is the greatest distance the fever goes inland?"

"Up the Umvolosi the fever country goes another twenty miles, including all the great game preserve. That preserve is a stretch of country triangular in shape between the fork made by the White and Black Umvolosi Rivers. The country is as dry as a bone; it has no water and the game have to drink in the boundary rivers. It is bad for fever despite the dryness, and 'fly' is abundant there. Nature seems to indicate the locality a game preserve. The game is well guarded from white men; the worst depredators are the wild dogs, which are plentiful and are terribly destructive. Mr. Brown has, I may mention, been a great sportsman, and a splendid book might be compiled from his experiences and adventures as a hunter. I asked him what had been his best shot. After a moment's consideration he came to the conclusion that his best was a double shot. Suddenly, while carrying a smooth bore with heavy charges, he came across, at forty yards distance, a troop of six buffalo. With his right he knocked over one, and then with the left he killed another. Some friends living in Durban were witnesses.

Asking for some further information about the great fever belt north of the Umvolosi he said that it was, he believed, some of the finest cattle grazing country in South Africa, but owing to fever it could only be utilized as grazing farms by relieving the terms of sale of the usual occupation clauses. The land is good all the year round for grazing, and in the winter—a good many showers fall at that time of the year—the fattening properties of the grass are marvellous.

"It seems to me," I remarked, "that when the fever country is set aside, also the land for Kafir locations, and the Provisos, the land available for white occupation will not be enormous?"

"No; it won't. I doubt whether a fourth of what one sees on the map will be suitable for white settlers. Few people in Natal have any idea of the extent of fever country in Zululand. Up to the Umhlatoos can be occupied along the coast; beyond, in the neighbourhood of the Hlabisa Magistracy, and about the Nongoma, while south of the Umhlatoos right up to the Transvaal all is occupiable. Natal Kafirs are just as susceptible to fever as whites, and coolies are more so. I have seen whole kraals down, and, their mabele sprouting, rotting and neglected owing to the owners not having the strength to beat it out."

"How do you account for dry areas being fever stricken?"

"I cannot. Take the Zoutpansberg district, for instance. There are no swamps there, and there is no damp, and, so far as I remember, there are no mosquitoes there. You can leave your guns out at night and they will show no rust, and yet it is one of the very worst fever places in South Africa."

"But the fever areas will gradually disappear: don't you think so? Take, for instance, the Barberton and Jamestown districts which were formerly so bad and are now occupiable?"

"Certainly. Some of the Zululand fever areas may become fairly healthy in the future, and others will become more or less habitable in the course of time.

Take, for example, the beautiful Origstad Valley, a real garden of Eden by the way, which was formerly so deadly that it had to be abandoned for years, and is now being re-inhabited. But the future is speculative; I am only speaking of fact as they are at present."

THE PONGOLA.

"Anything more about Zululand agriculturally?"

"Well, I think it will come within your scope if I say something about the Pongola. The earlier course of that splendid river, as you see on the map, is easterly till it moves off at right angles, almost due north. Now, at the point of that angle—a fact which is not known to many—the first, and what is the true bed of the river, is to be found. That bed leads to St. Lucia Bay. It is easily recognisable. Now, this is what I would suggest: liberate the river which is now emptying itself into Delagoa Bay and let it go where it went in ancient times, namely, our own bay, that of St. Lucia. The expenditure of a very few thousands would suffice, and the scour of St. Lucia Bay would be immensely improved. The benefits which would thus accrue—navigation, climatic, and otherwise, I won't attempt to foretell. That they would be great I feel sure. At present the water is running to waste past Lorenzo Marques; our duty is to lead it into its old channel for our own advantage.

Veterinary Departmental Report for May, 1903.

ABSTRACTS FROM REPORTS.

(Concluded.)

VRVHEID.—D.V.S. CROLE.

Rinderpest has practically died out in the northern portions of the New Territory, and, if the prompt measures taken nip the invasion of the disease at Denny Dalton in the bud, as there are reasons to hope, then the whole District will at last be free of the scourge.

Rhodesian Redwater has, so far, not reached the Pongola yet, but it is reported to have come as far south as the Assegai River. The whole northern

border of these Districts are as strictly watched as circumstances permit.

Horsesickness seems to have finished for the season.

Biliary Fever.—I have only come across one case this season, and that was in a racehorse brought up for the meeting.

Gallsickness.—Not many cases have occurred.

Redwater.—Several cases have been reported to me on various farms.

Lungsickness is still our chief trouble here. The main factors at work in keeping this disease going are (1) attempts to evade the law; (2) the shortness of the quarantine period; (3) old "lungers."

Scab does not exist beyond the Pivaan, but a good many flocks are affected in the Vryheid District, considering the paucity of sheep here as yet.

DURBAN.—D.V.S. AMOS.

The importations by sea have been as follows:—

Oxen	815
Sheep	202
Pigs.. . . .	28
Dogs	18
Horses.. . . .	10
Bulls	1
Cows	2
Calf.. . . .	1

1,080

The total is the smallest on record for some years, and is due to the closing of the Argentine ports owing to foot and mouth disease, and also the finishing of the charter of the s.s. "Zingara" that has traded continually between here and Madagascar.

The 815 oxen were from Madagascar; 200 of the sheep were for slaughter, and came from Australia; the pigs came from Madagascar; 7 horses came from India, 2 from England, and 1 from Beira; the bulls came from England.

Horsesickness, I am glad to say, has ceased.

Lungsickness.—Two outbreaks have been reported near Pinetown. The source of origin is undoubtedly traceable to the last outbreak on the farm Laangfontein. The areas are now in quarantine.

Foot and Mouth Disease.—Two ships have arrived during the month with this disease on board, and all the stock is being slaughtered at the outer anchorage. All animals acutely affected with the disease have been thrown overboard. Both these ships are still at the anchorage, and will not be allowed inside until they have been thoroughly disinfected. I am dealing with this outbreak in a special detailed report.

Tuberculosis.—Fifty Madagascar oxen and two cows have been submitted to the test, but no reactions have been obtained.

LADYSMITH.—D.V.S. O'NEIL.

Scab.—This disease is not very bad; there were six outbreaks reported and put under license.

Anthrax.—There have been three cases reported during the month, and in those cases that came under my notice I took the opportunity of instructing the owners as to the best methods of destroying the carcass.

Gallsickness.—This disease has been very bad in the Umsinga District, where ten deaths have been reported.

Tulip Poisoning.—Four cases have come under my notice; the animals were treated in time by the owner, with satisfactory results.

Lungsickness.—This disease is scattered throughout the district owing to the movement of stock during this time of the year. Four different outbreaks have been reported, which I am pleased to say were not of a serious nature, and they have all been placed under license.

Redwater.—Three fatal cases have been reported in the Acton Homes Division, otherwise the condition of the stock there is very satisfactory.

GREYTOWN.—D.V.S. CORDY.

Scab.—No fresh outbreaks for the month.

Rinderpest.—The disease made its appearance at the beginning of the month in Gayede's Location. Fortunately the site of the outbreak is near the Tugela, and almost enclosed by a loop of the river, making it easy to quarantine. The disease reappeared in the old quarantine area, but has caused little trouble, three animals only dying, and no others contracting the disease. Twenty deaths in all occurred during the month, at the end of which time only two cases existed, so that I hope to be able to report more favourably next month. The Thorn farms adjoining the high veld, which had been in quarantine since the beginning of the year, were

thrown open during the early part of the month, as it was absolutely necessary to get cattle off the high veld, especially those in low condition. No case of Rinderpest had existed on any of these farms. A small portion of the Location was also thrown open, and the quarantine extended to the north to include the seat of the fresh outbreak in Gayede's Location.

Dentistry.—An interesting case of dentistry in the horse came under my notice during the month. The owner informed me the animal was getting very thin and did not seem to eat his food in a proper manner. On examining the teeth, I found the molars to have worn in a very irregular manner, and two of them standing fully half an inch above the others, causing the animal to drop lumps of food back into the manger while trying to masticate. With the aid of tooth shears these teeth were cut off level with the others, and the remaining molars rasped to give the crowns a smooth surface. The horse is now able to feed well, and should soon recover his lost condition.

NEWCASTLE. — D.V.S. HUTCHINSON.

Glanders.—A case showing symptoms of Farcy had to be destroyed in Dundee on the 28th inst. Another horse had been in contact with this case and was submitted to the mallein test, but he showed no reaction.

Redwater.—Four cases of this disease have been reported; two died.

I regret to say that a total of thirteen cows succumbed apparently to the effects of a narcotic vegetable poison on the farm Snipe Marsh, Biggarsberg. The cases showed symptoms similar to those commonly known as Grass Staggers. Animals could be seen quietly feeding one moment and dead a few minutes afterwards. I only had the opportunity of making one autopsy: the subject had been dead two days and the *post-mortem* changes had discoloured the tissues, but there appeared to be an absence of any definite changes in the structure of any of the internal organs. On opening the cranial cavity, however, the brain and its

membranes were found to be in a congested condition, and the organ was surrounded by a quantity of watery fluid tinged with blood, and apparently of an inflammatory nature. The deaths were attributed, by people in the vicinity, to a certain grass found growing on the farm, but on forwarding a specimen of the grass to Mr. Medley Wood, A.L.S., for identification, Mr. Wood replied stating he had never heard that it had any injurious effect on cattle. The specimen sent is common to this District, and may be seen growing in many places. Mr. Wood, however, forwarded to me a small specimen of the *Paspalum scrobiculatum*, a grass which he informed me was sent to him by D.V.S. Webb, of Howick. Mr. Wood was good enough to enclose a description of this grass, and it is stated to be a deadly narcotic poison to cattle when ingested. I am now trying to ascertain whether this grass is growing on the farm in question or anywhere else in the District. It is, unfortunately, rather too late in the season, as the grasses have shed their seed, and the late heavy frosts have withered them up, which may render identification rather difficult. Between twenty and thirty head of cattle were lost on this farm about two years ago under similar circumstances. I advised the owners at the time to move the cattle on to other veld, and the animals stopped dying. The same course has been adopted in this instance.

HOWICK.—D.V.S. WEBB.

Grass Staggers in Cattle.—This month I have been called in to investigate a serious outbreak of this disease on a farm in the Karkloof, where six cows and two oxen had died and twelve others were sick.

In my last report last month I drew attention to the possible cause of this disease being found to arise from the ingestion of certain grasses. I had previously noticed in *Natal Plants*, edited by J. Medley Wood, A.L.S., that a particular grass, the *Paspalum scrobiculatum*, possessed poisonous properties during certain seasons of the year, so I

determined to have a look over the grazing ground upon which those cattle had contracted the disease, with the view of ascertaining whether any of this grass was present. The cattle had been feeding on a part of the farm where there was a considerable acreage of old arable land; the grass here was eaten almost bare. On going over this land I came across a grass which looked to me like a "paspalum," but which variety I could not determine, so forwarded samples of this and another grass to Mr. Medley Wood, who kindly examined them. He says: "The two grasses you send me are *Paspalum serobiculatum* and a *Digitaria*, and the first-named is the one which is most likely to be responsible for the trouble. . . . I know of no other grass in Natal that is really poisonous to cattle." It will be seen from the foregoing that there is a great probability that the poison from which these cattle are suffering is contained in this grass: it is one of which they are very fond, this makes it all the more dangerous. It could easily be mistaken for the grass which has received so much attention lately on account of its excellent properties, viz., the *Paspalum dilatatum*.

From Vol. II., Part II., *Natal Plants*, Grasses, by J. Medley Wood, A.L.S., the following is taken:—"A recent number of the *Kew Bulletin* says of this grass (*Paspalum serobiculatum*):—"Koklo or Koda Millet of India. An erect growing annual grass with stems about 2 feet high. It is widely dispersed through the tropics of the Eastern Hemisphere, generally regarded as a valuable pasture grass, and as an ingredient for hay. It sometimes attains a height of 6 to 8 feet. The grain is largely used as food by the natives of India, but it is by no means a wholesome article of diet. Unless special precautions are taken it is liable to act as a narcotic poison. Cattle, and especially buffaloes, eat the grass readily when it is young. The straw is occasionally used as fodder. *Animals are, however, carefully excluded from the fields when the crop is ripening, as they appear to suffer even more than men from the ill effects of koda poisoning.* It is

the "Ditch Millet" of New South Wales, and the "Herba a epec" of Mauritius. This grass is widely spread in Natal, but so far as our observation at present goes it is nowhere very plentiful. Native name, Samowisana." Since I have come to recognise this grass I have seen it growing in quite a number of places, particularly in old arable land, but I have seen patches in the ordinary veld. Would it not be well to make some feeding experiments with the grass during the time it is seeding to see if they would corroborate its poisonous character? It is quite a common thing for mysterious outbreaks of vegetable poisoning to occur, especially during late summer and autumn, and should this grass be the cause stringent measures must be taken to eradicate it. The symptoms shown by the cattle are as described in my last report.

MARITZBURG.—D.V.S. FYRTH.

Scab.—There have been three outbreaks of this disease, viz., 1 in the Umgeni Division and 2 in Upper Umkomaas Division. In the case of one outbreak, viz., that among Mr. Vanderplank's sheep at Mid-Illovo, I find he is a hardened offender, this being the fifth time he has had Scab without having reported the same, and I trust we shall secure a conviction against him: proceedings are being taken.

Lungsickness.—No cases during the month in any of the Divisions.

Horsesickness.—I only heard of three deaths from this disease in the City during the month. In the other Divisions no cases were reported to me.

General.—Stock generally seem to be doing well. During the month it was reported to me that one ox was dead and two sick of some unknown disease in the Umkomaas Valley. On my proceeding to see them, I found they had been bitten by some snake in the flank, about the position one would expect a beast to be bitten in lying down on a snake. These two cases were amenable to treatment, and I have heard of no other fresh cases from the same farm.

MOOI RIVER.—D.V.S. VERNEY.

Glanders.—An outbreak of this disease occurred at Mr. Leslie's, Campsie Glen. The animal affected was a brood mare recently brought from the Free State. Fortunately this mare had not been stabled. Inoculated five other horses that had been in contact, but failed to obtain any reaction.

Lungsickness.—No case of this disease has existed for seven weeks.

Rinderpest.—The quarantine restrictions were removed from the Hlatikulu area on the 31st inst. The disease at Mr. Comins', after commencing in a mild form, afterwards took on an acute form, some animals showing Rinderpest equal in severity to that seen in the outbreaks of 1897. The glycerinated bile used in

these cattle appeared to have no appreciable effect in checking the disease, and had serum not been obtainable I am afraid Mr. Comins would have been a very heavy loser. No fewer than 110 animals developed Rinderpest, and about 25 per cent. of these have died. The last case of sickness occurred on the 17th inst.

Redwater.—An imported bull showed the characteristic intermittent fever for nearly two months due to the action of the parasite of Redwater, and after an immense amount of care and trouble to the owner, I am glad to say the bull made a recovery. I shall be glad to get a suitable microscope so that I might be able to study the blood of these long and mild cases of illness due to the micro-parasite of Redwater.

Annual Report of the Director of Agriculture.

(Continued.)

FURTHER light on the agricultural situation may be thrown by a somewhat more detailed analysis of the statistics. In the first place, how much of the

total agriculture of 1902 was due separately to the Europeans, Natives, and Indians? The following table shows this:—

VALUE OF NATAL AGRICULTURE, 1902.
SHOWING DETAILS OF EUROPEANS, NATIVE AND INDIAN PRODUCTION.

	1 Live Stock	2 Live Stock brought into consumption	3 Animal Products	4 Crops	Total of 2, 3, and 4
NATAL PROPER.	£	£	£	£	£
European	5,527,411	823,007	115,405	1,223,384	2,161,796
Native	3,704,253	350,689	...	1,040,623	1,391,312
Indian	55,101	3,466	...	234,012	237,478
Total	9,286,765	1,177,162	115,405	2,498,019	3,790,586
ZULULAND.					
Europeans	216,695	31,975	284	5,977	38,236
Native	2,101,761	199,916	...	334,818	534,734
Indian	...	...	...	...	...
Total	2,318,456	231,891	284	340,795	572,970
WHOLE COLONY.					
European	5,744,106	854,982	115,689	1,229,361	2,200,032
Native	5,806,014	550,605	...	1,375,441	1,926,046
Indian	55,101	3,466	...	234,012	237,478
	11,605,221	1,409,053	115,689	2,838,814	4,363,552

From the above figures it appears that in Natal proper the main production is the European, which in 1902 constituted 57 per cent. of the whole; the Native production amounting to 37 per cent., and the Indian to 6 per cent. In Zululand there was no Indian production, while the European was only 15 per cent. of the whole, and the Native 85 per cent. Taking the whole Colony, the Europeans accounted for practically half the total production, but this was obtained mostly with the aid of Native and Indian labour.

The live stock throughout the whole Colony amounted in value to £11,605,221. In Natal proper the value of European live stock was £5,527,411, as compared with £3,701,253 for the Natives, and £55,101 for the Indians. The value of the European live stock was as 3 to 2 compared with that of the Natives. In Zululand, however the European live stock was only one-tenth the value of that of the Natives; and, taking the Colony as a whole, the Native wealth in this respect slightly exceeded that of the Europeans. It has already been pointed out that the annual value of the live stock, estimated as the amount brought into consumption during the year, amounted to £1,409,053. This is merely an estimate, as the statistics embodied no returns under this head.

As to the principal classes of live stock, the actual number of horses in the whole Colony was 66,695, there having been a gain of 10,487 on the previous year, 6,085 of which were imported; the number of cattle was 519,689, being a gain of 64,746; sheep totalled 562,402, there having been a decrease of 47,150 compared with the previous year; Angora goats numbered 78,450, showing an increase of 19,800; kafir goats numbered 532,639, there being an increase of 158,257; and pigs numbered 55,159, showing a decrease of 3,888.

It is instructive to trace back the course of the live stock industry for some years.

It cannot be said that the statistics disclose any remarkable progress in the pastoral wealth of the country during

the last eighteen years. In 1887 there were 60,326 horses in the country; in 1889, 61,226; in 1892, 62,087; in 1893, 65,026. In 1902 there were only 63,374, and 6,085 of these were imported. It is noticeable, however, that there has been since 1885 a fairly steady though slow increase in the horses owned by Europeans.

As to cattle, there are now 50 per cent. less than there were eighteen years ago. The number of cattle attained its high water mark in 1899, when there were, approximately, three quarters of a million. The decline of the cattle industry was due to the rinderpest in 1897, and the figures show what a terrible blow this scourge gave. The disease killed off half of the cattle belonging to the Europeans, and in two years six-sevenths of those belonging to the Natives. In two years the total number of cattle was reduced from 738,732 to 232,323, there being a loss of, approximately, 500,000, which at the price of cattle then prevailing was equal to £3,000,000. This was a serious loss for so small a country, and it speaks well for the farmers that they came out of it so well. The European farmers have now practically recovered from the effects of the outbreak, their cattle numbering 231,781 in 1902, as against 242,165 before the Rinderpest outbreak. The Natives have not recovered the lost ground. At one time they were wealthy in cattle, owning in 1889 no fewer than 570,407. The Rinderpest left them with only 75,842, and at the present time they own only 167,319.

The sheep industry has shown a decline within the last ten years. It attained its maximum between 1892 to 1895; at the present time it is barely on a level with its position eighteen years ago. This decline has been wholly in the European sheep industry. In 1885 the Europeans owned 798,681 sheep; in 1895, 950,187; and in 1902 only 485,726. The decline during the last four years is largely accounted for by the fact that the late war put an end for the time to the influx of sheep from the interior territories; and by the fact that many of the Natal sheep were slaughtered by

the military forces. The sheep industry was specially prominent in the north-west portions of the Colony, which were the scene of the military operations in Natal.

The Angora goat industry has not progressed, and is less now than eighteen years ago. There was an increase of 34 per cent. in 1902 as compared with 1901; but there have been greater increases and greater decreases in previous years, and this, therefore cannot be taken as an indication of permanent improvement.

The common goat industry has remained almost at a dead level since 1885, but the last year's statistics show an increase of over 50 per cent. amongst goats owned by Natives.

The pig industry has shown but little tendency to improvement amongst either Europeans or Natives; it was highest in 1895.

Taking them as a whole these live stock statistics may, at first glance, seem somewhat disappointing, they may not show that expansiveness and progress which is usually looked for in a young colony; but allowance must be made for the effect in recent years of the war just closed, which for a time disturbed the agriculture of the whole Colony, and for two, and in some cases three, years put a total stop to all agricultural operations in the northern districts. As regards the cattle industry, the Rinderpest is a sufficient explanation of want of progress, and the difficulties in the way of importation of new stock caused by Red-water or Tick Fever make the task of re-stocking the country slow, tedious, and costly; indeed, it is creditable to the European farmers that they have already regained the ground lost in 1897. Horseshickness amongst horses, and blue-tongue amongst sheep also account for much. Now that peace is established and that live stock diseases are, owing to recent investigations, being better understood, and preventive measures adopted, better progress in the future should be anticipated.

Turning now to the crops, the total crops of the whole Colony in 1902 amounted in value to £2,838,814, reckoned at Colonial prices. These crops were obtained from 742,919 acres, which were distributed as follows:—

ACRES UNDER CULTIVATION IN NATAL, 1902.

	European.	Natives.	Indian.	Total.
Natal Proper	193,356	344,529½	36,279½	574,164½
Zululand ..	2,289½	166,465	...	168,754½
Whole Colony	195,655½	510,994½	36,279½	742,919½

Out of a total of 18,617,000 acres in the whole Colony, 742,919, or 4 per cent. of the whole, were under plough. The question arises: Was this a sufficient proportion? How does it compare with the proportion elsewhere? In New Zealand, with a total area of 66,861,000 acres, 1,557,086 acres, or 2½ per cent. of the whole, were under crop in 1901, not counting what was laid down in artificial pasture. In Victoria, out of a total of 36,245,760 acres, 3,322,028, or 5.9 per cent. of the whole, were under crop in 1901, not counting fallow lands and artificial pasture. In this respect Natal stands mid-way between the two countries. But the chief consideration is as to how much much ploughed land is needed to feed the population. The population of Natal may be taken as 779,000 in Natal proper, and 201,000 in Zululand. The population of Victoria in 1901 was 1,208,705, and of New Zealand, 787,657 Europeans and 43,143 Maories; and the number of cultivated acres per head of population are shown in the following statement:—

AMOUNT OF LAND UNDER PLOUGH IN VICTORIA, NEW ZEALAND & NATAL.

	Per cent. of total area. Acres.	Per Head of Population. Acres.	Per White Farmer. Acres.
1901 Victoria ...	5.91	2.76	81
1901 New Zealand ...	2.33	1.87	62 (2)
1902 Natal Proper ..	4.78	.73	75½
1902 Zululand ...	2.55	.80	11

In the last column of the above table is a statement as to the average number of acres ploughed by each white farmer. In respect of its ploughed land considered as a proportion of the total area, and of the average number of acres cultivated by each white farmer, Natal proper compares favourably with the other Colonies; but in respect of the amount per head of population it occupies a very

low position. Indeed there can be no doubt that Natal does not cultivate sufficient land to feed its own population. This will be better appreciated in connection with the fact, shown in the following table, that the yield per acre is less than in the other Colonies:—

AVERAGE YIELD PER ACRE OF MAIZE, BEANS, PEAS, AND POTATOES.

	Maize, Bushels.	Beans, Bushels.	Peas, Bushels.	Potatoes, Tons.
Victoria ...	60	16'9	16'9	3'15
New Zealand ...	39	36	32'9	6'18
Natal Europeans ...	15'7	8'8	8'8	1'73
„ Native ...	10'6	..	..	64
„ Indian ...	16'3	6'2	..	1'05

It is in these facts, namely, the comparatively low average yield per acre of the staple food stuffs, and the small amount of land cultivated per head of population, that the explanation of the economic position of the Colony is to be found.

There is no doubt the Colony requires more land to be cultivated; and, on the other hand, the farmer, to ensure the profitableness of cultivation when prices fall, will need a higher yield per acre.

It is commonly current in Natal that there have been great changes in the direction of agricultural development during the last eight to ten years. The following table shows the extent of this development, so far as the area under cultivation is an indication of it:—

ACRES UNDER CULTIVATION IN NATAL PROPER.

	European.	Native.	Indian	Total.
1885	88,386	299,852	...	388,248
1886	84,295	318,385	...	402,880
1887	65,883	253,450	...	319,333
1888	...	...	...	...
1889	70,152	241,193	...	311,345
1890	...	...	...	...
1891	85,861	305,376	...	391,237
1892	102,672	394,339	...	397,018
1893	159,074	360,670	...	519,744
1894	99,968	401,398	...	501,366
1895	115,612	337,204	...	452,816
1896	104,377	255,258	11,723	371,358
1897	123,973	301,237	25,340	450,550
1898	136,366	276,483	25,899	438,748
1899	...	...	...	...
1900	175,160	303,390	38,268	516,818
1901	196,284	332,875	41,512	570,671
1902	193,356	344,529	36,279	574,164

AGRES UNDER CULTIVATION IN ZULULAND.

	European.	Native.	Indian.	Total.
1897	...	...	...	147,399
1898	...	...	...	112,357
1899	...	...	...	...
1900	1,495	118,061	...	119,556
1901	1,075	136,619	...	137,694
1902	2,289	166,465	...	168,754

The above figures for Natal proper do indeed indicate an advance; a somewhat fluctuating course, but on the whole upward. The advance is not in the Native cultivation, but amongst the Europeans, and in the last few years amongst the Indians. The advance amongst the Europeans has on the whole been continuous and steady; and this fact is the most hopeful amongst all those disclosed by the statistics. It cannot be said that the statistics show a great improvement, for the land under cultivation by Europeans in 1902 was not much more than double that cultivated eighteen years ago, and was only 22 per cent. more than in 1893. But in the last few years especially the advance has been steady.

The average profitableness per acre of crop growing in Natal is not easy to estimate; but some suggestion of it may be obtained from a consideration of the average gross value per acre:—

AVERAGE VALUE PER ACRE OF NATAL CROPS IN 1902.

	European.	Native.	Indian.	General Average.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Natal Proper	6 6 64	3 0 7	6 14 6	5 4 6
Zululand ...	2 12 3	2 0 3	...	2 0 5
Whole Colony	6 5 8	2 13 10	6 14 6	3 16 5

The comparatively low average value of the European crops in Zululand is accounted for by the fact that several acres are in wattles and fruit trees not yet in bearing.

The average values per acre are high, and are accounted for by the high local prices, not by the heavy crops. Only few countries publish the average value

per acre of their crops, and a general comparison cannot, therefore, be made, but the following are the average values per acre in the United States of America stated in dollars :—

Maize.	Wheat.	Oats.	Barley.	Rye.
9'02	7'61	7'63	8'32	7'73
Buckwheat.	Potatoes.	Hay.	Cotton.	
8'37	34'78	11'39	14'31	

The general average being about 10 dols., or £2 per acre. In Victoria the average value of wheat is about £1 5s. per acre ; oats, £2 ; hay, £2 10s. ; and potatoes, £6 ; and the general average of all crops is £2 2s. per acre.

As to the comparative yields per acre, the following scattered figures will be of interest :—

COMPARATIVE YIELDS PER ACRE OF SOME STAPLE CROPS.

	Maize	Beans	Peas	Pota- toes	Sweet Potatoes	Turn- ips	Sugar	Tea	To- bacco
	Bshl.	Bshl.	Bshl.	Tons	Tons	Tons	Tons	Lbs.	Lbs.
Natal (European)...	15'7	8'8	8'8	1'73	2'19	10'1	'98	468	891
Victoria ...	60	16'9	16'9	3'15					
New South Wales .	28			2'14					1149
Queensland	20			2'05	5'04		1'80		678
New Zealand ..	39	36'0	32'9	6'18					
India ..								365	
Ceylon ..								369	
England ..		26'4	25'9	5'96		12'1			
Scotland ..		32'3	24'7	5'57		14'8			
Canada ...	60			3'05					
U. States America .	25			2'09					
Trinidad ..							1'54		
British Guiana ..							1'82		
St. Lucia ..							1'75		
Hawaii ...							3'90		
Java ..							3'34		

In respect of its turnips, tea, and tobacco, Natal stands well on the above list ; but it is notable that in respect of its staple crop, maize, it stands lower than any of the other countries quoted. The comparative low yields of many of the crops are due in great part to insect pests and blights. Indeed, just as diseases uncontrolled by correct knowledge and central direction have kept back the live stock industries, so these pests also uncontrolled by correct knowledge and central direction have kept back the crop growing industries. But the knowledge already gained and being gathered by current investigations will, when properly enforced and systematically applied throughout the country, reduce to a minimum these hindrances to progress. It is the uncontrolled ravages of these insect and fungoid pests which are the chief drawbacks to crop growing in Natal ; it is not the climate, for, notwithstanding severe hailstorms here and there and so-called droughts, Natal is

favoured above the average in respect of its climate. Nor is the backward condition of agriculture here due, as some suppose, to any inferiority amongst the white farmers : on the contrary, the average intelligence amongst them is above that in most of the other Colonies, in fact they are more on a level with the planters in India and Ceylon, and many of them are men of education, comparative wealth and enterprise. The way in which they have grafted European notions of agriculture on to the primitive pastoral nomadic notions of the country, and have enlisted the limited intelligence of the Kafir and made it of practical service, is an achievement, and is an illustration of the adaptability of the Colonist.

Some of the agricultural developments in Natal are both creditable to the country itself and of interest to outsiders. In the wattle industry it leads the world, and in no other country has

wattle planting been so systematised as here. The tea industry is a progressive one, and the fine factory on the Kearsney Estates, in which the latest machinery is worked by electric power, would not be easily surpassed anywhere. The sugar industry is an important one, though not as progressive as it should be. It is still in the stage when the chemist is regarded as an unnecessary innovation, instead of as the real accountant of the business, who from the field to the market has to account for every cwt. of sugar, whether in the field, or in the mill, or on the platform. Tobacco growing as an organised industry is yet barely in its infancy, but there are small beginnings both in cigars and pipe tobacco which are promising well. The largest acreage, and the heaviest yield per acre, is amongst the Indians, but the tobacco they produce is mostly the common coarse kind used by the Kafirs.

Under favourable conditions magnificent crops can be grown in this country. In fact, there can be no doubt in the mind of any one who has studied the agriculture of Natal in the light of the agriculture of other countries that there is nothing of a physical nature to prevent Natal growing wealthy by means of its agriculture, provided that the advanced methods of the present day are systematically and energetically applied throughout the country. But there should be no misunderstanding on this point. By the application of advanced methods is not meant the introduction from other countries of certain implements and machinery, or certain methods of growing particular crops or using fertilisers, or certain details of practice in regard to diseases and pests: what is meant thereby is the thorough and intelligent study and investigation of local difficulties and conditions, until in this way the methods necessary to meet these difficulties and conditions are ascertained and proved beyond a doubt, and then the systematic application of these methods throughout the country by Governmental means where necessary.

However not even with the best of knowledge and energy could the present farmers of Natal make the country

wealthy, for the simple reason that there are not enough of them. The statistics return the number of white farmers in Natal and Zululand in 1902 as 2,786. That this number is practically correct there can be no doubt. The Police returns give the number as only 2,689; the directory gives the names of 2,814 who are designated as farmers, but 53 of these are resident in towns.

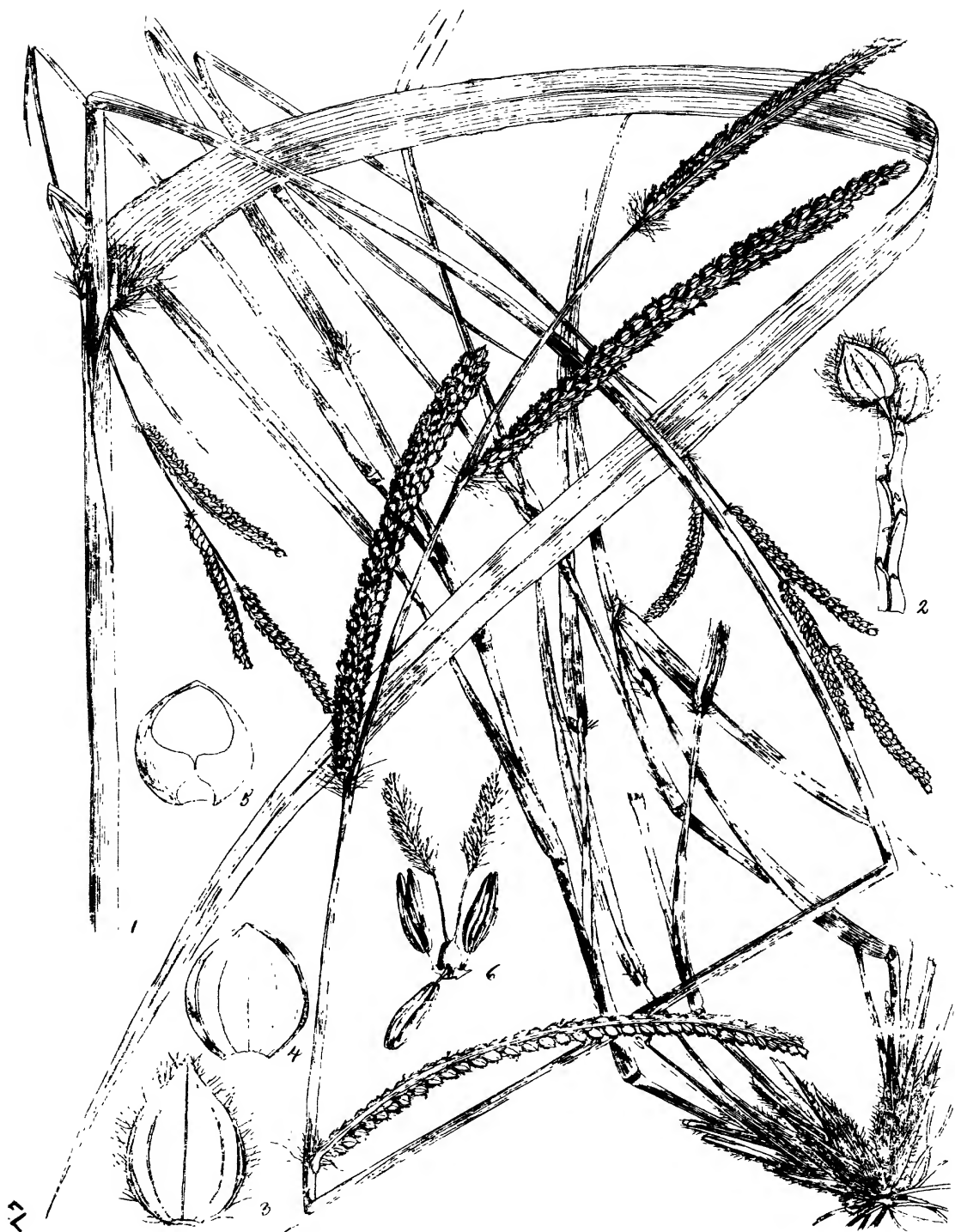
The following table, which gives the three-yearly average number of white farmers in Natal since 1885, and the number of acres cultivated by them, is instructive:—

NUMBER OF WHITE FARMERS IN NATAL AND ACRES CULTIVATED.

	Number of White Farmers	Acres Cultivated by White Farmers.	Average number of Acres Cultivated per White Farmer.
1885-7 ..	2,167	79,521	37
1889 ..	1,952	70,152	36
1891-3 ..	2,251	115,871	51½
1894-6 ..	2,316	106,871	46½
1897-8 ..	2,831	131,670	46½
1900-2 ...	2,816	189,890	67½

Including absentees, there are perhaps 3,050 farmers altogether, and amongst these are apportioned 8,225,996 acres, or an average of 2,700 acres each. To the Australian or Canadian farmer this fact will appear surprising.

Such a state of things is not in South Africa peculiar to Natal. Natal has derived its land policy from the Cape, which in its turn obtained its policy from the ideas of the Dutch, inherited from two and a half centuries ago. In respect of country there are certain resemblances between Australia and South Africa; but in respect of land policy there is absolute antithesis. For whereas in South Africa in the early pastoral stage of the Colony a policy was initiated and since continued of alienating the land in large areas suitable for the primitive pastoral industry, in Australia this policy, though commenced, was soon stopped, and the lands were afterwards merely leased for pastoral purposes: so that when the country reached the stage in which closer settlement be-



PASPALUM DILATATUM (POIR.)

- 1.—Inflorescence about natural size.
- 2.—Rhachilla with two spikelets *in situ*.
- 3.—Upper glume.
- 4.—Upper valve.
- 5.—Palea.
- 6.—Ovary, styles, stigmas, stamens, and lodicules. *All enlarged.*

came necessary, the Crown had the land to offer to the small settler.

In South Africa, which in parts has now reached the stage for closer settlement, the land is in the hands of the private owner. The private owner is thus a fortunate individual, with great opportunities, which he may use or not to the advantage of himself and his adopted country.

There are here in Natal Proper only three ways in which closer settlement can be effected :—

- 1st. The landowner may himself cut up his land into smaller areas, and either sell these or place tenants thereon.
- 2nd. The Government may expropriate private lands and form settlements thereon.
- 3rd. The Government may assist the private landowner to form settlements on his own land.

The third method has many points in its favour; it would be much less costly than the second, and would be more expeditious and far more thoroughly managed than the first. There is room for the application of all three methods; but whichever may be adopted the existing landowner has the advantage.

In the Report of the Lands Commission, dated 7th February, 1902, the necessity for closer settlement was affirmed, and in a report by the Surveyor-General and myself, dated 10th July, 1902, and published in Government Notice No. 480, 1902, details of a scheme for closer settlement were drawn up. In this report, which it may be mentioned was received with favour throughout South Africa, and was noticed in many parts of the world, the principle was adopted of leasing for pastoral purposes those portions of the remaining Crown lands which are at present too inaccessible for close settlement, until such time as the progress of the Colony shall bring them into demand for general agriculture; and for settlement on private lands attention was given

to the three methods above stated. Subsequently, under Ministerial instructions, the Surveyor-General and myself drew up detailed notes for a Bill to be prepared on these lines, and, so far as practicable, on the lines of the Lands Commission Report. In this draft Bill special attention was paid to provisions necessary for success of settlements, such as roads and railways, schools, agricultural education, encouragement of an export trade, advances to settlers for preliminary works, and for establishing factories needed for preparing and marketing agricultural produce.

But apart from closer settlement much may be done in the way of improving the existing agriculture. The investigations of recent years are disclosing the means of controlling the ravages of diseases and pests in both animals and plants. Now that the European farmer has recovered the ground lost through the Rinderpest outbreak, he will be in a position to undertake the improvement of his dairy herds, and will have every inducement to do so when prices of stock fall to normal level. In crop growing the average yields per acre may be raised by the application of fertilisers, by the prevention of pests, and by the use of seed better suited to local requirements. The value of fertilisers is being understood, and the imports of manures for local consumption are rapidly increasing amounting in value to £20,393 in 1901, and £41,279 in 1902. The introduction of seed better suited to local conditions will be a work of time, necessitating, in many cases, the production of new varieties by cross fertilising and local selection. But this matter is as important as the use of fertilisers, it being well known that some varieties are twice as prolific as others. The introduction of labour-saving appliances is another direction in which improvement may be made, but is not so simple here as in most other Colonies, owing to the fact that under present conditions of agriculture all labour-saving appliances must be specially adapted to the intellect of the Kafir.

(To be continued).

Effect of Fertilizers on Yield of Peaches.

TO those peach growers who wish to know the effect of fertilizers on the yield of peaches (says Mr. A. D. McNair, Superintendent, Carolina Experiment Farm, U.S.A.), the data gathered this year at the Experiment Farm of the North Carolina State Horticultural Society at Southern Pines, N.C., may be interesting and instructive.

On land which the native farmer has passed by as nearly worthless for agricultural purposes, and which in its natural state produced only tar and turpentine through the medium of the long leaf pine, we have succeeded in growing good healthy peach trees which are producing profitable crops. The orchard which produced the yield mentioned in this article is six years old and is composed entirely of Elbertas. The trees are headed low and have been pruned back each year, thus forming a stocky sturdy type of tree.

The orchard is divided into plots of one-tenth acre each with broad roadways between each plot, and the soil is kept in clean cultivation. Each plot is fertilized differently from every other plot, and two check plots are without fertilization.

The difference between the various plots is plainly observable in the size of the trees and the appearance of the foliage. The trees on plots which receive no fertilizers are distinctly inferior to the trees on other plots though they have borne well, considering their size, up to the present time.

The superiority of complete fertilizers (those containing nitrogen, phosphoric acid and potash) over incomplete fertilizers (those lacking one or more of these elements) is again confirmed by our results. There are, indeed, some anomalies in the returns which seem to contradict the returns as a whole, as in the case of Plot A, which received phosphate and potash but no nitrogen, and which yielded less than the plots receiving no fertilizers; but this may fairly be called an accidental result, not only because it is contrary to general experience, but because it is contrary to the returns from other plots. It will be noticed that the largest yield was on Plot J, which

received the largest dressing of nitrate of soda (375 pounds per acre), together with moderate quantities of potash and phosphoric acid.

Fortunately, we were not troubled with the brown rot this year, but it is probable that such a large dose of nitrate of soda will increase the percentage of rotten peaches where the rot is prevalent. The yields given are calculated to a full stand, and are about 10 per cent. larger than the actual yields.

Various accidental causes have reduced the stand more in some riots than in others, but there is no evidence that these differences correspond to differences in fertilization.

Fruit which was observed by the pickers to have rot specks was left temporarily in the field and is not included in the yields given. All yields are expressed in pounds per acre, and values are calculated from actual sales and represent the net values of the fruit after paying for crates and all shipping expenses.

	Fertilizer per Acre per Year.	Yield of Peaches per Year in lbs.	Value per Acre. Dols.
Plot A	400 lbs. acid phosphate 100 lbs. muriate of potash	1,690	41.92
Plot B	125 lbs. nitrate of soda 100 lbs. muriate of potash	4,500	112.10
Plot C	125 lbs. nitrate of soda 400 lbs. acid phosphate	3,870	96.60
Plot D	125 lbs. nitrate of soda 400 lbs. acid phosphate 100 lbs. muriate of potash	7,160	178.63
Plot E	No fertilizer	2,220	55.13
Plot F	125 lbs. nitrate of soda 200 lbs. acid phosphate 100 muriate of potash	7,380	184.10
Plot G	125 lbs. nitrate of soda 800 lbs. acid phosphate 100 lbs. muriate of potash	9,720	242.43
Plot H	125 lbs. nitrate of soda 1,200 lbs. acid phosphate 100 lbs. muriate of potash	9,720	242.43
Plot I	250 lbs. nitrate of soda 400 lbs. acid phosphate 100 lbs. muriate of potash	12,770	328.58
Plot J	375 lbs. nitrate of soda 400 lbs. acid phosphate 100 lbs. muriate of potash	15,600	389.16
Plot K	No fertilizer	3,190	79.29
Plot L	125 lbs. nitrate of soda 400 lbs. acid phosphate 200 lbs. muriate of potash 2,000 lbs. lime once in five years	7,450	185.92

A secondary effect of the fertilizers concerns the time of ripening. The orchard was picked over eight times on the following dates:—July 28, 30, 31, August 1, 4, 6, 8, 11. The proportion of fruit picked in each plot during the first four pickings is expressed by the following table:—

Plot A 85 per cent.	Plot G 59 per cent.
Plot B 49 per cent.	Plot H 51½ per cent.
Plot C 61 per cent.	Plot I 24 per cent.
Plot D 37 per cent.	Plot J 12½ per cent.
Plot E 70 per cent.	Plot K 80 per cent.
Plot F 76 per cent.	Plot L 49 per cent.

Though this percentage is greater in the unfertilized plots than in most of the fertilized plots, yet there was actually more pounds of fruit picked on the fertilized ones during this period, except on Plot A, in which the results are regarded as accidental.

The size of the fruit was good throughout, but noticeably larger from the fertilized plots, and somewhat better coloured.

The average value of the fruit from the two unfertilized plots was 67.21 dols. per acre. The gain in value per acre of the fertilized peaches over the

average of the unfertilized ones is calculated as follows:—

	Dols.		Dols.
Plot A	25.29	Plot G	146.61
Plot B	44.89	Plot H	176.22
Plot C	29.30	Plot I	261.31
Plot D	111.42	Plot J	321.95
Plot E	116.89	Plot L	118.71

All the peaches were good size and fairly well coloured. They were packed in six basket carriers, which is the popular package in this State, and were all shipped to northern markets, the largest and most profitable consignment going to Boston.

It took an average of 19 to 20 peaches to fill a basket, or from 114 to 120 crate or carriers, but we packed one crate with 60 peaches and had not room for another one of the size, though there was room for small ones. A few samples were selected which measured 10½ inches in circumference, and weighed 10½ ounces each.

It is perhaps needless to say that we thinned our peaches at the proper time, and this had much to do in promoting large growth.

Farm Life in New Zealand.

IRRESPECTIVE of other interest, there is an attractive freshness in the following description in *T. P.'s Weekly* of how farm life in New Zealand appeared to a young Englishman:—

Some two years ago considerations of health led me to seek for a time an open-air life in one of our Colonies, and having decided to spend a time in New Zealand, I went out to that Colony by the somewhat rough and stormy route via the Cape and Tasmania, and landed at the port of Wellington. Shortly after landing I set off up country to look up a friend from home, who had been in the Colony for two or three years, and was working on a farm some miles from Feilding. . . . The main entrance to a house, by the way, in New Zealand is at the back. I knocked at this door, and was soon admitted into the presence of an English lady, who seemed to know all about me, and gave

me a warm welcome, and then my friend appeared. It was then rather late, so we soon turned into our bunks out in the whare (the Maori word for their style of hut). We rose early the following morning, and as I wanted to get into harness at once, I went out to receive my first lesson in milking. I was not very successful at this at first, but was soon able to say that I had "milked five cows this evening."

LIFE AS A NEW CHUM.

I stayed here for a week or two, turning my hand to the numberless new occupations that a new chum must master, and which at first he invariably does wrong. I must here speak on the folly of the idea held by all "new chums," namely, that if only they are willin' and have sufficient strength they can at all events do farm work all right. This is a great mistake, for of

all professions on earth farming requires the most skilful workmen, who must not only be able to do any or all of the work of a farm, but also be able to adapt themselves to deal with the new requirements which are always turning up. A man must have experience before he can become even a passable ploughman, shearer, milker, carter, or axeman, and it is really a fact—cold but true—that till the new hand gets such experience he does not earn his keep. Let anyone who thinks this statement exaggerated try any one of the occupations named for a few minutes only, and he will soon see that these apparently simple tasks require more concrete knowledge than he had ever before conceived of.

After staying about a fortnight with my friend, a neighbouring farmer named Brown offered me, in effect, bread, butter, and a little jam in exchange for my work. Probably the jam would have been omitted if I had not already had some experience of farm life in another Colony. However, I gladly accepted this offer, and my life with him I will now describe as briefly as possible. The season was late summer, and I worked on through the winter and early spring, when I left for England. The summer, though hotter than our own, was very pleasant. The winter, generally speaking, was like a severe and prolonged English autumn, with occasional beautiful sunny days. But the nights following these warm days were bitterly cold, and the range of temperature in the twenty-four hours was very trying. I believe it takes about two or three years to get acclimatised to a New Zealand winter. The rainfall was very heavy, and what was once hard, dry ground was soon worked up into a sea of indescribable mud, which continued till spring brought dry weather again. One quickly got hardened to the mud, and also to working out of doors in anything short of a deluge, and given good water-tight boots no ill consequences need be feared from either.

PET ANIMALS.

I was called at six o'clock each morning, and turned out to milk our two

cows, which Brown had usually got ready in the yard for me, before I came blinking along with the milk-pails. One of these cows was a beautiful little Ayrshire, of whom I made a great pet. The other was a big short-horn, with legs like those of a cart-horse, who always had to be well leg-roped before she could be milked. I had two other pets in the shape of calves, who had to be fed with warm milk every morning, and whose pretty ways made it plain how natural it was to get very fond of animals that one has brought up oneself. I do not think that even the savoury pig is an exception to this. The little Ayrshire cow would, at one time, answer by a gentle low "mow" to the slightest word that I said to her. One night I remember coming back from Palmerston with Brown rather late, and we had been anticipating that the cows would have gone "up to the back again," when they found no one came to milk them. However, I sung out my usual call, and was delighted to hear a friendly little lowing in response, as this meant that we were spared a search for them in the darkness in a large paddock strewn with logs and stumps.

The morning milking done, the previous day's milk had to be skimmed, the fresh put in pans, and the dairy utensils washed. Then I attended to perhaps three lots of pigs, and having mixed them a toothsome swill, went into breakfast if it was ready. Often I would chop up the daily supply of firewood before this meal if it were not already done. Brown usually brought down and fed the horses while I was doing the other early morning work. Breakfast ready, we would go in and do justice to a large plate of beautiful porridge, and a helping of cold lamb or mutton, and sometimes, for a treat, bacon. We always used baker's bread, not because we preferred it, but because the housewife had too many other duties to attend to to find time to make bread. Breakfast finished, the day's work proper began, and we would go ploughing, carting, log-sawing, fence-mending, or working amongst the sheep. Lunch was at 12.30, and a good tea about 7. Brown had

rather a weakness for afternoon tea and hot scones, and usually indulged himself in that respect, with me to help! Before tea the horses were turned loose and fed, the cows milked for the second time, and, for me, the day's work was done.

HARD FOR THE WOMEN.

But now I come to a feature of the life in that Colony which left a somewhat painful impression on my mind, and that is the hard lot of the women-folk. Their day's work is by no means done at tea time. They have probably begun the day after a bad night with a sleepless child, and consequently not feeling "fresh." They must first dress the children, and what more tasking than to get the clothes on to three or four little lumps of life? She probably

has no servant, and if her husband is unable, has now to get breakfast amidst the clamour of the aforesaid youngsters, by this time with ferocious appetites calling for it. Their wants satisfied, she gets what breakfast she can herself; but if she has to feed baby at the same time, does not get much. Breakfast done, she must wash up and clean the bedrooms, and dinner has to be thought of. Her whole day is thus busily occupied till evening, when the men come home for tea, usually with a feeling of satisfaction at having done work for the day. After tea the effects of a day's work make themselves felt, and a good chair or sofa, and if one be not too tired a book, are most acceptable. But these joys are not for the mother, who must again wash up, this time with her man's help, and put the children to bed.

Water Conservation.

IN a recent issue Mr. J. M. Handley advocated the making of dams on an extended scale throughout the Colony. The following, contributed by H. G. McKinney, M. Inst. C.E., to E. Rich & Co.'s *Quarterly Magazine*, Melbourne, bears on the views expressed by Mr. Handley:—

FIRST ATTEMPT AT LEGISLATION REGARDING WATER RIGHTS.—THE CASE MET BY THE WATER RIGHTS ACT.

In the first article of this series I referred to the fact that while the early settlers—in the Central and Western Divisions especially—found that the construction of dams on the creeks and rivers was a matter of the utmost importance to them, they possessed no legal right to construct any such works. The first serious attempt, so far as I am aware, to remedy this state of affairs was the introduction of the Pastoral Dams Bill by the late Hon. W. A. Brodribb, M.L.C. This well-meant bill fell through chiefly on account of its being suitable only to certain districts and to a limited set of conditions. It did not recognise

the fact that while dams of more than 6 or 7 feet in height might be objectionable on some creeks, a height of 20 feet or more might be adopted elsewhere to the benefit of all parties concerned. The only way to provide for the settlement of disputed questions regarding dams was to avoid laying down any hard-and-fast rule, and to deal with every such work on its own merits. This was the principle adopted in the framing of the Water Rights Act, and it is beyond question that much good has been done by this Act in giving security for hundreds of highly useful works, and in encouraging the construction of others of a still better character.

DAMS BENEFICIAL TO DOWNSTREAM LANDHOLDERS.—WATER ABSORBED IN A DRY CHANNEL.

The fact that dams of suitable design and construction are, as a general rule, beneficial to the landholders below them is steadily, if slowly, being recognised. In times past any landholder who constructed a dam across a creek or river was regarded by the lower holders as something akin to a robber; but more

intelligent views are now becoming the rule, though occasionally we hear of wild statements on the subject, emanating from people who do not take time to think. A roughly approximate idea of the loss of water which occurs when a river or creek begins to flow in a channel which has become thoroughly parched is obtained by considering the amount of rainfall which would be required to saturate the ground before any surface water would flow off. Looking at the question in this way, and assuming that a fall of 3 in. of rain would be required to thoroughly saturate the soil, it would appear that in a creek having a sectional outline of 120 feet, the loss of water, if a flow commenced in a channel when dry, would be nearly a million gallons in every mile. This is, of course, merely an approximation; but it is sufficient to indicate the great quantity of water which is required to saturate the bed and banks of a creek when a flow commences after a drought.

DISAPPEARANCE OF SMALL FLOWS

It is a fact well known to those acquainted with the creeks in the Central and Western Divisions that small supplies of water flowing in at the heads of the creeks will gradually disappear before the water reaches any considerable distance from the point of inflow. With fairly large supplies cases have come to my notice where the water passed into a creek with a depth of 5 or 6 feet, flowing at the rate of a mile to a mile and a half per hour at the point of inflow, and yet did not travel on an average more than four or five miles per day. These facts fairly illustrate the difficulties under which water flows in natural channels which have become thoroughly dry and parched.

DESTRUCTION OF DAMS NOT BENEFICIAL TO LOWER HOLDERS.

There are other reflections to which these considerations give rise. In times past the destruction of dams by landholders below them was not an uncommon occurrence; but it very seldom happened that anyone was benefited by such action. The cause of this is obvious in view of the facts stated.

USEFULNESS OF DAMS TO LOWER HOLDERS ILLUSTRATED BY YANKO AND COLOMBO CREEKS.

A comparison between the Yanko and Colombo Creeks, in Riverina, affords one of the best practical illustrations of the benefits arising from the construction of dams. The Colombo has a very different channel as a rule, being in many places very broad in proportion to its depth, and irregular in its section throughout. The Yanko, on the other hand, is comparatively narrow and deep as a rule, and, taking it altogether, should carry water at a better velocity than the Colombo. As a matter of fact, the water is carried more quickly and with less loss in the Colombo than in the Yanko. The former has a most complete system of dams, the water in several cases being held back by one dam to the base of the dam next above; while the latter has very few dams, and has in one part a length of nearly 70 miles without a single dam. Thus the channel of Colombo Creek, when not actually filled with water, is at least damp, while, after a drought, a large proportion of the channel of Yanko Creek is quite dry. The natural conclusion to be deduced from these facts is that residents on the lower part of the Billabong Creek, into which the Yanko and Colombo Creeks flow, are benefited by the dams on the Colombo, and are losers through the absence of a complete system of dams on the Yanko.

GRIEVANCE AGAINST THOSE WHO NEGLECT TO CONSTRUCT DAMS.

The instance quoted does not by any means stand alone. Cases have repeatedly happened where ill-considered agitation has been raised against dams, when, as a matter of fact, the dams were a positive benefit to the lower holders who objected to them. The real grievance in such cases was not against those who construct dams, but against those who neglect to do so. If intermittent rivers such as the Lachlan and the Macquarie, and all the intermittent creeks in the Central and Western Divisions were provided with suitable dams throughout

their whole lengths, it would be a great benefit to all parties concerned, and particularly to the lower holders.

DAMS WHICH ARE OPEN TO OBJECTION.

While the construction of dams of suitable design deserves every encouragement, it must be mentioned that there are many dams to be found which do not come within this description. Prominent among these are the earthen dams, whose bywashes cut away during every flood and choke up the bed of the creek below them. Such dams are a source of constant trouble and expense to their owners; and, as they cause waste of water and silting up of the creeks, they constitute a reasonable ground for complaint on the part of the landholders below them. Cases of this kind are to be found where the outlay repeatedly necessitated by a succession of floods has been more than would have been sufficient to convert the dam into an overshot. Where good natural bywashes are not obtainable, overshot dams should be constructed as a rule, and it seems probable that in many cases this rule will in future be insisted on.

EFFECT OF OVERSHOT DAMS IN REGARD TO SILTING AND SCOURING.

An interesting point in connection with the construction of overshot dams, and one which should be taken into consideration in their design, is the effect they are likely to have in causing silting up of the creek or river. While in many cases the tendency of such works is to cause the deposit of silt in the channel above them, there are also many cases in which the reverse effect is the result. The excellent natural weir on the River Darling, at Brewarrina, has caused the scooping out of the bed of the river for miles above it. The same effect on a smaller scale is noticeable at various rock bars along the course of the same river. On the other hand, large deposits of silt have accumulated on the upstream side of many overshot dams or creeks in Riverina. The effect which such a dam will have, whether in causing silting or scouring, depends on several factors, the most important of which are the nature of the material in the channel,

the velocity of the current, the suitability of the site, and the design of the dam.

CHARACTER OF DAMS SHOULD DEPEND ENTIRELY ON LOCAL CONDITIONS.

—VARIETY OF CONDITIONS ON THE RIVER LACHLAN.

The choice of the site for a dam, the height to which the dam can advantageously be carried, and the best materials to be used are points which have to be settled independently in every case, after taking the local conditions and requirements into account. The conditions in different districts, and even in different parts of the same district, present such variety that any attempt at generalising should be avoided. If a site can be obtained where nature has already provided the best part of a dam, a highly useful work may be completed at a very moderate cost; but it will be seriously misleading if such a case is quoted as a rule for a river or creek on which such a site happens to be found. A site of this description has been utilised in a very creditable manner at Forbes, on the River Lachlan. On the same river a weir was constructed in 1890 at the head of the Willandra Billabong, in a site presenting exceptional disadvantages. The foundation of the work is a quick-sand, the soil around is friable alluvium, and both banks are liable to inundation. So far as I am aware, this was the first crib-work weir of any importance constructed in this State. A succession of floods commenced about the time that the weir was completed; but no harm was done, and the only repairs which have been required have arisen from the sinking of the stone in a few of the cribs, thereby necessitating, at a trifling outlay, the re-packing of some of the top layers. As the object of the weir in this case was to divert water into the Willandra Billabong, the choice of site was practically limited to that adopted.

IRREGULAR FALL OF CREEKS AND RIVERS.

A point which must always be borne in mind when deciding on the character of a dam is that the rate of fall, and,

therefore, the velocity of water, in a river or creek differs widely in different places. This fact is very liable to be overlooked where the river or creek flows through what appears to be a uniform, plain country. The River Lachlan is a prominent instance of this characteristic. In the Warroo Estate, between Condobolin and Forbes, several dams of rubble backed with earth have stood very satisfactorily; while on the same river, both above and below that neighbourhood, there are places where similar dams would certainly be a failure.

NECESSITY FOR SPECIAL CARE TILL DAM HAS COME INTO SUCCESSFUL USE.

Dams of almost every kind in common use require careful watching up till the time when they come into successful operation. An ordinary earthen dam, or an overshot dam with earth backing, may be constructed with every ordinary care, and yet may fail when the first considerable flow of water reaches it, if a lengthened period of dry weather has occurred after the completion of the work. The shrinkage of the earth in the dam is likely to cause cracks, and if the rise of the water on the dam is rapid, there will be a leakage, which is almost certain to be disastrous to the work. In the case of timber overshot dams with earth backing, a method of averting this danger was described in the August number of the *Review*, this method consisting in the use of ruberoid behind the timber sheeting of the dam. When the water rises the dam becomes consolidated, all interstices are soon filled up, and, assuming that the construction of the work is suitable, no further special precautions should be required.

PROTECTION OF STONE DAMS.

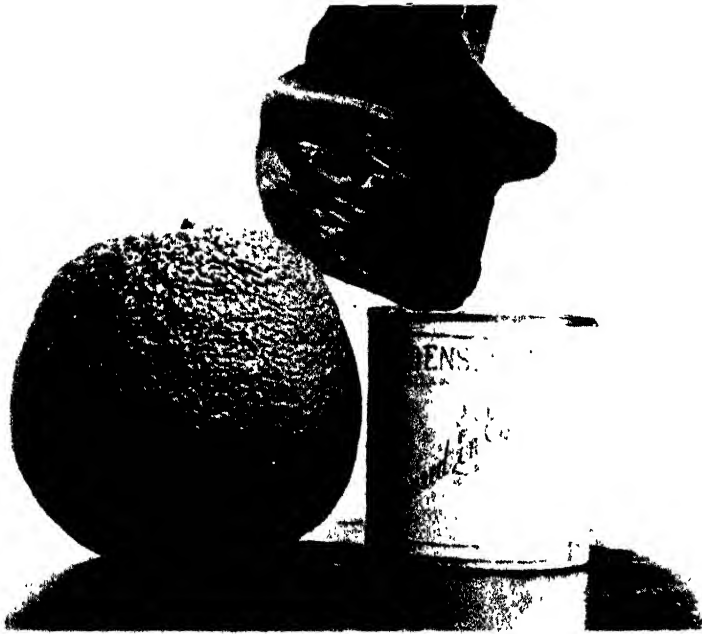
In the case of stone dams backed with earth, a similar danger has to be guarded against; but, in addition, there is the danger of some of the stones being swept away from the downstream face, thereby making a gap which would rapidly be extended. In South Africa the practice of protecting the stonework of such dams with galvanised wire netting is largely followed. The benefits arising

from this practice are obvious, as it ensures the holding of the stonework in position until the interstices are filled and the work has consolidated in position.

ULTIMATE EFFECT IF WORKS SHOULD BE TAKEN INTO ACCOUNT.

The whole subject is one of the utmost importance—particularly to the Central and Western Divisions—and it is beyond question that the ultimate effect of the works to be constructed will, in some cases at least, require more attention than it has received in the past. It should not be forgotten that the general tendency of the rivers and creeks of the whole country west of the Dividing Range is in the direction of silting up, and that this tendency has to be reckoned with and guarded against. A temporarily useful work may be the cause of much subsequent loss and trouble, and when cases of this kind are multiplied on any river or creek the result will bring disaster. The easiest method that I know of to destroy the usefulness of a creek in the plain country is to have badly-constructed dams in its channel, and to cut down the trees on its banks. On the other hand, as already pointed out, suitably designed works for conserving and supplying water are a permanent benefit to all parties concerned, and on such works the progress and prosperity of the country will largely depend. While the enterprise shown by landholders in constructing dams under discouraging circumstances has been highly commendable, it is to be hoped that with the security provided under the Water Rights Act, and the encouragements held out under the terms of the Western Lands Act, a still better class of works will be undertaken in future.

In growing English potatoes in the West Indies it is always necessary to spray the plants from the beginning with Bordeaux mixture to maintain them free from disease. It has been shown that by spraying not only is disease kept thoroughly in check but larger potatoes are obtained, and they keep longer.



THE NATAL VICTORIA ORANGE.

See Interview with Mr. DAVID BROWN, J.P.

The Hackney a Hundred Years Ago.

WE have been asked by a correspondent to take over the enclosed from the *Live Stock Almanac* of 1902. Readers desiring to see more on the Hackney, especially as regards his suitability for South Africa, should refer to Mr. Fred Hutchinson's article on *The Breeding of Saddle and Harness Horses*, which appeared in No. 11, Vol. IV., to the letter of Mr. W. Henwood, No. 12, Vol. IV., and to the letter of Mr. James McDonald, No. 13, Vol. IV.:—

The engraving reproduced in "Live Stock Journal" Almanac, 1902, is "Roan Billy," foaled some time previous to the year 1800, which was a Norfolk Hackney. That county was famous for its breed of strong short-legged Hackneys, which could carry weight and trot a mile in $2\frac{1}{2}$ minutes. John Lawrence, writing in the year 1809, after describing the hunter days of the Hackney, says:—"Let us place him before a trotter, a horse the customary and best pace of which is the trot, but one which has sufficient speed in that pace to race."

The Hackney, at the period referred to, was essentially the useful horse, indispensable in the days of road travel for both saddle and harness. The best stamp of coach horse had a cross of Hackney blood in his veins, and, as we learn from numberless records of trotting matches—many of them wonderful feats, both as regards speed and endurance—the Hackney was the racehorse of the road. That he should be both fast and enduring is only what we might expect from the ancestry of the breed. On the male side, the Hackney traces his descent from "Blaze," son of "Flying Childers," foaled in 1715; while on his dam's his origin may be traced to an earlier date than that of the thoroughbred, he having in his veins the blood of the old English racehorse which ran on the turf before the days of Charles I. Thus he comes of an ancient stock, famous on both sides for speed, staying power, and ability to carry weight.

The purity of blood on the male side of his pedigree makes the true Hackney an impressive sire. He stamps his likeness and character on his progeny, as do sires of all long-established breeds. The

higher the antiquity of his breed, the more marked is the influence of a stallion on the foal he gets.

Foreign horsemasters have long appreciated his value. The merits of the breed were quickly recognised on the Continent, and French, German, Hungarian, and Russian breeders and agents have purchased from us the best sires and dams money could procure, for the purpose of improving the useful horses it has for generations been their aim to produce for cavalry, artillery, and transport.

A judicious blend of Hackney blood with the lighter mares of draught breeds—Suffolk, Clydesdale, Shire, and Cleveland—produces a strong and active horse with plenty of courage, courage and good temper being among the most noteworthy characteristics of the Hackney. Our forefathers bred their best horses for the coach, light wagon, and saddle on these lines. We have ceased to do so, because the necessity of maintaining supplies of such animals passed away to a great extent, so far as the needs of daily life are concerned, when the railway superseded the mail coach and men ceased to travel by road.

Even though we did not possess the voluminous printed records of old writers to prove the high esteem in which the Hackney breed was held by our ancestors, we should find ample proof of the value attached to it in the many portraits of fine examples of the breed which were painted by well-known artists and engraved for publication. The frequency of such portraits in old magazines demonstrates the interest taken in the Hackney at the period when horses for hard and fast work on the road were in demand.

A great trotting horse in those days had more than local fame. He held a position in popular favour which may be compared to that held by a great racehorse of the present day. His performances were familiar to all who took interest in horse breeding, and those performances were of a character which proved the animal endowed with the best and most useful attributes of horseflesh.

The South African Butter Trade.

IN the *Agricultural Journal* of Victoria, Mr. Kirk Hunter writes:—

This trade is one of such magnitude that every country that can lay any claim whatever to the production of butter is making an endeavour to secure a footing in the market, and it is a somewhat striking illustration of the trend of the trade that the two countries, Argentina and Canada, whose butter is mostly spoken of here at present, do not appear in the list of countries whence butter was imported during 1901. The unfortunate drought, which has existed in Australia, provided them with an easy opportunity of establishing themselves in the market, of which they have not been slow to make the most. The Argentine exporters particularly have been most energetic. They have established agencies, and succeeded in securing a considerable amount of business.

The following are the imports for 1901, from which it will be seen that Victoria's contribution is more than half the total, and the supply from the Commonwealth exceeds two-thirds:—

	lbs.	£
United Kingdom	718,127	38,782
Natal	122,303	6,918
New South Wales	1,193,060	57,333
New Zealand	109,351	5,331
Queensland	191,032	9,148
Tasmania	544	37
Victoria	3,337,096	176,651
Belgium	13,640	867
Denmark	380	27
France	5,434	418
Germany	36,884	2,694
Holland	304,822	18,892
Delagoa Bay	10,000	751
States over the Border	43,208	3,739
Other Countries	152	2
Total	6,086,033	321,590

I have endeavoured to obtain the statistics of imports for 1902, but the Customs staff is so busy preparing the annual returns for the Government that they cannot possibly let me have them for three or four weeks.

One or two Australian agents that I have spoken to regarding this trade appear to treat it somewhat lightly, and seem to think the return of good seasons, with better supplies, will mean also the return of the trade that at present is going to the Argentine. That is not my opinion. Argentine butter has come to stay, and its position in the market will be strengthened by the remedying of any little defects of method that may exist in the production at present. I hope, therefore, Victorian firms engaged in the trade will attach due seriousness to the strength of their opponent, and adopt every means possible to retain the trade and maintain the high reputation of their produce.

A considerable quantity of the butter received during the last few months in execution of Victorian orders has been New Zealand made, the boxes being so branded. This is not good for Victoria, and I have been told that "if it is good enough for your exporters to fill my orders from New Zealand, it is good enough for me to go there direct for my requirements." I fear that my explanation that it was only under very exceptional circumstances, such as then prevailed, that such a course was necessary, failed to convince the gentleman spoken to that he should continue in the same groove for his requirements.

The conditions and fluctuations of the Australian butter market are very closely followed here by those engaged in the trade, and they have not failed to notice that recently considerable quantities have been stored "for a rise" during the autumn and winter months. For this to be a successful move necessitates the condition that there are no other competitors capable of keeping the price down, and I am not sure that such a condition now exists. It may have been successful in the past, but then Argentine was not competing on the extensive scale that she is now, and if she can continue to supply the African market with

the quantities I am told she is capable of supplying, it would appear to be a mistake for our exporters to store too much or too long, and it is desirable they should watch closely how it is likely to affect them.

ARGENTINE BUTTER.

During the course of my enquiries amongst the merchants here and in Durban and elsewhere, I find that many of them are importing Argentine butter, and speak very highly of it. The retailers also regard it favourably, and I have not met with any instance of a complaint having been made.

The readiness of the local importers to adopt this Argentine butter is due mainly in the first place to its being placed on the market at a time when Australian supplies were short, and prices high, and having gained the *entree* to the trade because of their lower prices, they have, by supplying a uniformly good article, succeeded in establishing a reputation for quality and value that cannot fail, if maintained, to mean the rapid growth of their trade.

I learn from those who have been to the Argentine and know the conditions of the dairying industry there, that the continuity of supplies is assured, and that preparations are being made for next season that will make them very formidable competitors indeed.

One large firm here informed me that agents of several Australian firms had intimated to them that butter would be very dear later on. To protect themselves against this anticipated rise they took advantage of the prevailing low price in Argentina and placed a contract for six months' supplies at 10½d. f.o.b. Buenos Ayres, and I believe a number of other firms here followed the same course. As the import charges are slightly lower than from Victoria, this butter will not cost more than 10¾d. c.i.f.

This butter is one of the best known and most favourably regarded Argentine brands—"El Pampa"—and is made in three classes, namely:—"Unsalted," "Mild" and "Salt." I procured a sample of each and submitted them to Mr. Woodin, the Dairy expert at the Cape Government Agricultural College, for

his opinion. I also sent a sample of Canadian, and he reports on them as follows:—

1. "The sample marked 'Unsalted El Pampa' I should say has been treated with brine, as it undoubtedly is slightly salted, but not heavy enough to retain its flavour, which I should say when freshly made was good. The aroma and texture are fairly good and the sample is well freed from water."
2. "The sample marked 'Mild El Pampa' runs the 'Salt El Pampa' very close, but is lacking in texture and the flavour although good is not clean and distinct, neither is it so firm as the 'Salt El Pampa,' although I consider the aroma of this sample the best of all."
3. "The 'Salt El Pampa' lot is the best all round sample, the aroma being fairly good, the colour the best of samples, the texture is the best and the sample was fairly dry, the flavour being cleaner and better than any other lot."
4. "The lot marked 'Canadian' I do not consider a good sample; although perhaps the driest and firmest of all the samples, it is the most greasy in texture and has not a fine butter aroma or flavour."

One firm that formerly handled Victorian and New South Wales butter in large quantities became dissatisfied with the quality of the consignments coming forward, and recently placed big contracts with a South American firm at 11d per lb., c.i.f., while expressing the intention of "giving the Australians a go for the trade."

QUALITY MUST BE MAINTAINED.

It can hardly be denied, and is much to be regretted, that a good deal of the complaint and dissatisfaction amongst importers regarding Victorian butter is justified by the considerable quantities

of low grade qualities lately received, and the time has arrived when, if the trade is to suffer permanent injury, exporters should take every care to maintain and protect the reputation and standard quality of their individual brands. That many instances exist of recent shipments indicating that this precaution had not been taken can be easily gleaned in the course of conversation with local importers, and it cannot but recoil disastrously upon the exporter. This, I think, some must have already discovered. In some instances the butter sent has not been equal to the quality previously received under the same brand. This has caused a strong feeling of dissatisfaction and distrust, and created the desire to change to other markets if favourable conditions are obtainable.

When a brand has become well established in the market, and secured a high reputation for its excellence and uni-

formity of quality, then under all circumstances these features should be preserved, and if the state of all the producing industry at any time is of an abnormal character—such as recently existed—and the standard of quality which made the reputation of the brand cannot be continued at the old quotation, then the price should be raised, and the quality maintained. If the customer cannot or will not give the higher rate, then another grade, no doubt, could be supplied at his limit, but under a different brand, and with the distinct understanding that it is not the same quality as previously had, until such time as the market again permits of the original brand being submitted at or about its former price.

Fluctuation of price we know is unpreventable, but the exigencies of the market should not be met by variation of quality.

Pound Notices.

THE following stock, unless previously released, will be sold on the 5th August next:

Krantzkop.—One dark dun cow, aged, has an old brand, appears like W. 4 or W. X.

Nongoma.—Fourteen goats, six white half bred Angoras, eight black-and-white kafir goats.

Albert Falls.—Bay mare, 14 hands, has indistinct brand on the near hind quarter, looks like A. G.

To be sold on the 19th August next.

Utrecht.—Black gelding, branded, reversed broad arrows near rump, has saddle mark withers, long mane and tail, good condition, value about £15, 14½ hands, impounded 24th June, 1903; grey pony gelding, no visible brands, no hair on head from mange, patches on body, has lump under saddle, value about £8, 13 hands, fair condition, impounded 24th June, 1903; white mule gelding, branded N right shoulder, and indistinct brand, looks like M right rump, has slit left ear, much harness marked, value about £15, fair condition, about 14 hands, impounded 29th June, 1903.

On the Farm Spitzkop, occupied by D. Grobler.—Red Madagascar ox, no brands.

Nqutu.—Bay filly, 2 years old, both hind legs white, star, snip, about 12-2.

Acton Homes.—Black goat, about 4 months old; black ox, tips of horns cut off, no brand or mark.

Howick.—Black and white ox, head black, white brush, branded S 7 on right hip; red and white ox, white brush, indistinct brand right hip; chestnut gelding, 14½, branded H in circle on near hip.

Mooi River.—Dark red yearling ox, little white on belly, white spot on forehead, piece out of tip of right ear, left ear squared, branded

on right hind leg, looks like D; Dark red yearling ox, piece out of tip of right ear, left ear squared, branded on right hind leg, looks like D.

Weenen.—Dun and white cow, swallow-tail right ear, with black heifer calf, white mark on belly; no brands; impounded by Natal Police, Weenen; supposed property of Native Nqubana, who was driving the cattle without a pass and who has failed to prove lawful ownership.

Merao.—Bay gelding, aged, 14 hands high, bad sore back, poor condition, no brands impounded on the 19th June, 1903.

Normanhurst, Boston.—Four sheep, brand very indistinct. These were impounded about the middle of May.

Dannhauser.—Bay mare, right hind foot white, white star, no brands.

Acton Homes.—Black yearling bull, notch in right ear, piece cut out of left, indistinct brand on right quarter, about 18 months old. The above animal will be sold at the expiry of one month from this date (1st July) if not previously released; bay stallion, small patch of white on forehead, branded on right hind quarter A, about 14 hands high; probable value about £12; impounded by Mr. A. A. Odedaal, "Quagga's Hoek." The above animal will be sold at the expiry of one month from this date (4th July) if not previously released.

Ladysmith.—Dark bay or brown entire, with dark points, about 13½ hands high, 5 years old, tail and mane medium length, been dressed off a little, old scar under saddle, no brands visible, probable value £6, impounded by Sergeant Stewart, Natal Police, Elandsbaagte, on 29th June, 1903; the above animal will be sold at the expiry of one month from this date (5th July) if not previously released.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ... N. Grant ... J. Raife ... J. G. Maritz ... P. H. Boshoff ... N. Robbertse ... F. B. Moor ...	Snelster. Branfontein Frere Springbank Riet Vlei Spitzburg Greystones Klipstone
J. Button .	Estcourt, South of Bushman's River	"	J. Mattison ... Unknown ..	Mooi River Pound Eversdale.
J. J. Hodson ...	Lion's River ...	"	J. E Oates ... J. Piccione ...	Greenfields Hilton
E. J. B. Hosking ...	Upper Umkomanzi	"	W. Henderson ... J. Bayes .	Meyer's Hoek Ntimbankulu
K. Soutar ...	Portion of Lion's River	"	J. A. Vanderplank C. J. Smythe ...	Strattherne Howard
J. Swales ...	Manda and Indwedwe	"	J. Chadwick ... K. Soutar ... Pumputa & Charlie	Stey Braes Indwedwe.
W. Wilson ...	Polela ...	Lungsickness Scab	Nkangala ... J. D. Watson ... H. Nicholson ... H. Brown ... J. Stone .. J. Comrie ..	Mount Sergeant. Rainbow X.L. Farm Prosperity Gowrie Hepburn
J. L. Trenor ...	Alfred ...	"	W. Niemack ... Volwayo & Nvuna	Macton Location
A. H. Ball ...	Weenen ...	" Lungsickness	A. D. J. Taylor ... Seddon & Harris	Baconsfield Weenen Common- age
E. Varty ...	Umvoti, Western Portion	Scab	J. G. Nel ...	Filldale
W. Gray ...	Upper Tugela, south of Tugela and Estcourt, north of Bushman's River	"	F. Zunczel ..	Beaulieu
R. J. Raw ...	Impendhle ...	"	C. P. Speirs ... Albert Meliffe ...	Mount Park. The Forks
B. Vause ...	Ixopo ..	"	A. Watson ...	Forest Hill
C. Swales ...	Umlazi ...	Lungsickness	Cold Storage and Supply Co. ... Native, Sam Pawkes	Richmond Farm, near Pinetown Assegai Kraal, near Botha's Hill
		"	John, & Mr. Kirk	Umlazi Location

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In the above infected areas there are 39 herds of cattle under license for Lungsickness, and 32 flocks of sheep under license for Scab as under:—

Natal—	for Lungsickness.	for Scab
Newcastle Division ...	...	...
Klip River ...	5	13
Dundee ...	—	3
Umsinga ...	4	2
Upper Tugela (North of Tugela River) Division ...	—	—
Utrecht District ...	—	2
Vryheid ...	9	6
Paulpietersburg ...	2	—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	2 for Lung sickness	2 for Seab.
" Nkandhla and Nqutu Districts...	...	...	9	4
" North of White Umfolosi and Umfolosi Rivers	...	...	8	"
Total	...	39	32	

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe District, Umlalazi District, Mahlabatini District, Umfolosi District, Nqutu District, Nkandhla District, Ndawandwe District, Nongomo District, Vryheid District, and Paulpietersburg District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 24th June, 1903.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of June, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903. June 1	Apples	1,439 cases	Albany	Australasian	Free of Pest.
" "	Pears	15 "	"	"	" "
" "	Potatoes	15 "	"	"	" "
" "	Plum and Fruit Trees	2 large bndls.	"	"	Unclaimed. Destroyed, 30/6/03.
" 8	Apples	2,510 cases	"	Warrigal	Free of Pest.
" 11	Potatoes	85 bags	London	Umtali	" "
" "	Ornamental Plants, Harrismith	2 cases	"	"	" "
" 11	Potatoes	500 boxes	Buenos Ayres	Suffolk	" "
" 12	"	400 cases	London	Beira	" "
" 17	Bulbs	1 parcel	"	Scot	" "
" "	Ornamental Plants	2 cases	Calcutta	Malvern	" "
" 19	Apples	962 "	Albany	Sophocles	" "
" "	Fruit Trees, Plum, Apple, etc., W.H. Savory	17 large pkgs.	"	"	Fumigated.
" "	Fruit Trees, Plum, Apple, etc.	19 cases	"	"	"
" 20	Potatoes	399 baskets	Mombassa	Nuddia	Free of Pest.
" 22	"	700 bags	Las Palmas	Inkosi	" "

Custom House, Durban, 4th July, 1903.

C. B. JONES, Examining Officer.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of June, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).			RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.	
Estcourt (James Lewis)	70	22	Nil.	...	...	...	...	...	26.20
Adamshurst (Wm. Adams)	91	37	10	...	...	1	10	5th	20.58
Hilton (Archibald Pearce)	83	31	29	...	...	3	16	21st	23.52
P.M.B., Town Bush Valley (Wilkinson's Nursery) ... ..	...	...	44	...	...	4	23	5th	36.91
Ixopo, Gorton (Chas. Green)	72	34	09	...	...	1	09	5th	33.43
Mid Illovo	76	40	97	...	...	4	77	4th	34.41
Mcunt Edgecombe (Natal Estates)	87	44	65	...	...	3	39	20th	33.75
Cornubia ... ..	...	...	77	...	...	...	...	...	35.78
Milkwood Kraal ... ..	...	...	33	...	...	...	...	...	26.58
Blackburn ... ..	...	...	82	...	...	...	...	...	31.37
Saccharine ... ..	...	...	47	...	...	...	...	...	30.47
Prospect Hall ... ..	...	...	66	...	...	...	...	...	30.16
Clairmont (J. R. Blamey) ... ..	...	...	75	...	...	3	33	5th	35.87
Equeefa (W. Hawkworth)	87	50	26	...	...	3	15	23rd	35.36
Umsinto, Beneva (E. W. Hawkworth) ... ..	...	...	33	...	...	3	13	22nd	34.02
Central Experiment Farm (Manager)	81	30	34	...	...	2	18	5th	...

District Reports.

DRONK VLEI, 3rd July.—From a rough estimate the farmers of Dronk Vlei will have about eight thousand bags of mealies; but for the frost would have had many more. The mealies are selling for 25/- per sack. The native tenants generally speaking have good crops. There is no danger of starvation amongst them for a wide radius round this settlement. I hear a local storekeeper has ordered 1,000 bags of American mealies for the East Griqualand trade. There is a great scarcity of potatoes owing to the drought and blight. One drawback to those settlers without wagons is the cost of transport, which is from 2- to 2.6 per cwt. to Richmond station, only 40 miles away:—considerably more than the shipping rates from Durban to London. No close settlement ought to be laid out in Natal unless near a railway. Cattle have done well, they have been infested with very few ticks this year compared to last. Those who used the Quarter-civil vaccine have found it to be a perfect preventive: one farmer lost a calf last spring through the veterinary department having no vaccine to supply when ordered.

EDWARD MARRIOTT.

NEW HANOVER.—The weather has been as usual for this time of winter. We have been having dews and occasional heavy frosts. Cattle that are not stall fed are in a somewhat poor condition. The mealie crop this year is not a good one.

A. RITTER, Magistrate.

LOWER UMFOLOSI DISTRICT, 4th July.—The weather during June was fairly pleasant. Disagreeably high winds from the south were experienced on the 4th, 10th, 11th, 18th, 20th, 21st and 26th. Most remarkable was the "cold snap" with high wind, of 20th and 21st. Slight showers of rain fell on the night of the 18th, during the morning and afternoon of the 22nd, and on the 28th during the night. Only four deaths among stock were reported as caused by rinderpest: one beast died also from goring by another, a second from enlargement of spleen, a third from swelling of liver and lungs, and a fourth from ordinary fever, so far as could be judged from a *post mortem* examination made by an intelligent court messenger (Native): hence it will be seen eight deaths in all were reported to Magistrate. On the 12th four Native rinderpest guards were engaged and handed over to Stock-Inspector Cheesmat, to be stationed in the coast locations of Mbonambi and Sokula. The small crops of mealies mentioned in last report as doing so well unfortunately were destroyed by the "cold snap" above mentioned. Still, Natives have not lost heart, and are digging and planting mabele already in spite of the droughtiness of the present rather severe winter, they having noticed, like myself, the wild lilies called "iduzana" and "umbodhya" flowering during the third week in May last, which is deemed to augur well for an early planting season.

A. R. R. TURNBULL, Magistrate

Market Reports.

Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.

MARITZBURG.—Messrs. W. H. Walter & Co. write:—The market, just now, is completely upside down. Dealers in grain were assured by their agents at the Point that the duty would be reduced from 2s. per 100 lbs. to 1s. per 100 lbs., but apparently, owing to the delay at the Cape in pushing the new Customs Convention, the reduction has been deferred. Calculations have been upset, and consequently one hears grumbling all round.

Mealies.—A few Natal mealies are coming forward, but not in sufficient quantity to be worth notice. Prices at the market have been, about 10s. to 11s. 9d. per 100 lbs. North American mealies and South Americans are coming forward, but it would be unwise to give quotations, as all are awaiting the decision of the Cape.

Forage.—Very little offering, and prices have reached 8s. to 11s. 1d. per 100 lbs.

Hay.—The supply far from abundant, and prices for inferior have been 1s. 8d., but better samples have realised from 2s. 8d. to 3s. 6d. per 100 lbs. Bedding, from 1s. to 2s. per load.

Potatoes.—As predicted months back there is an abundance of good tubers but prices are not high. Several mornings prices were down to 6s. per 100 lbs.; better samples, however, realised 11s., 11s. 1d., and 13s. 9d. per 100 lbs. Sweet potatoes, 5s. 9d. to 8s. per sack.

Vegetables.—Beans, from 17s. to 20s. 9d. per 100 lbs.; peas, from 5s. to 5s. 3d. per 100 lbs.; pumpkins, from 4s. to 11s. per dozen.

Butter.—From 1s. to 2s. 6d. per lb.

Eggs.—From 1s. to 2s. 5d. per dozen.

Poultry.—Common fowls from 1s. 10d. to 4s. each; ducks, from 4s. 6d. to 9s. per pair; guinea fowls, from 8s. to 10s. per pair; turkeys (cocks), 9s. to 13s. each; (hens), 6s. to 8s. each.

Sundries—Venison, 6½d. to 1s. 0½d. per lb.; beef, 6½d. to 8½d. per lb.; mutton, 7d. to 1s. per lb.; pork, 4d. to 7½d. per lb.; ham, 1s. per lb.; bacon, 9d. to 10½d. per lb.; trussed fowls, 2s. 6d. to 4s. each; dikops, 2s. 3d. p. r brace; hares, 2s. 9d. to 3s. 6d. each; partridges 2s. 3d. to 3s. 9d. per brace; fish, 4½d. to 6d. per lb.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, celery, eschalots, lettuce, onions, peas, radishes, tomatoes, and turnips

Fruit.—Bananas, lemons, naartjes oranges, pineapples, constitute the varieties sold.

Firewood.—From 3½d. to 1s. per 100 lbs.

DURBAN.—Mr. W. H. Edmunds, Box 44, writes:—

General.—Trade continues dull beyond words, and no ray of light presents itself to illuminate the near future.

Mealies.—White North American are quoted at 13s. per muid, and white South American at 11s. 9d. The latter variety are exceptionally good, and far cheaper relatively. Colonial grain is worth about 17s. 6d., but a drop may be considered certain when the new duties come into force.

Forage.—Good samples bring 10s. per 100 lbs., but demand is small.

Potatoes.—All prices, best colonial, about 15s. Good supplies of the imported article come along weekly, and it is these which depress the market. The colonial crop would appear to have far exceeded anticipations.

Very little mabele or hay is offering. All other lines in produce are in plentiful supply, and in the buyer's favour.

JOHANNESBURG.—Mr. W. H. Th mas, Box 1,960, writes:—

The market this week has changed considerably as regards the prices for mealies and mabele, but forage and Natal hay remain about the same. Potatoes and onions have gone up a bit and seem to remain firm. For tobacco there is no sale. Oranges, naartjes, and pines are coming in plentifully now and are still firm in price. Vegetables, mostly, from the neighbourhood, chiefly carrots, leeks, cauliflowers, parsley and turnips, and cabbages from Cape Colony, are all firm in price, too. The following are the prices for the week ending to-day:—

Barley per 163 lbs.—Only a few bags were offered, realising 16s. to 18s. per bag. These were not of best quality.

Barley, green, for forage, per 100 bundles.—This seems to be getting scarce now, prices 35s. to 50s. per 100 bundles

Bedding per load, dry grass.—Any amount still comes in, realising pretty well 8s. to 40s., according to size of vehicle.

Bran per 100 lbs.—Only a few bags were sold this week from 9s. to 10s. 6d. per 100 lbs.

Chaff per 100 lbs.—This is firm; prices ruling from 9s. to 10s. 6d. per 100 lbs. Every day some 50 to 60 bales come on to the market.

Kafir Corn per 203 lbs.—Local grown, some few hundred bales have been on the market this week, realising from 26s. to 28s. 9d. for whites, red 30s., 32s. 6d. Bombay white, 24s. to 24s. 6d. Mozambique, 22s. to 22s. 6d.

per bale. **Sweet Grass** 5s. 6d. to 6s. 6d. per bale of 70 to 80 lbs.

Mealies, 203 lbs.—Large quantities of local stock coming in now and being sold for 24s. to 24s. 6d. per 203 lbs for yellows, whites 24s. 6d. to 25s. Mozambiques, 20s. 6d. to 22s.; of this latter the town is full, and several holders are trying to realise as soon as possible before the new South American mealies come in.

Oat Hay per 100 lbs.—Of this the quantity coming in remains about the same as usual daily, and prices are very firm at 10s. 6d. to 12s. 6d. per 100 lbs.

Onions per 125 lbs.—This line is also firmer this week, as the large supplies of last few weeks have all been sold out, and prices are firming up again, 18s. to 21s. per bag.

Potatoes per 163 lbs.—This remains firm. Good local potatoes from 28s. to 32s. 6d. Imported from Cape Colony and Natal Early Rose also from district for good stuff, 24s. to 26s. Other kinds good, 22s. to 24s. Medium 15s. to 20s.

Eggs per doz—Local, new, 3s. 6d. to 4s. 6d.; imported, 2s. to 2s. 6d.

Poultry.—Fowls, 2s. 6d. to 3s. 6d., 4s. to 5s.; ducks, 6s. to 7s.; geese, 8s. to 10s.; turkeys, hens, 7s. to 9s., cocks, 12s., 17s.

Cattle.—Slaughter oxen, £18, £22 10s.; trek oxen, £14 to £16; cows £10, £16; milch cows £25 to £30; sheep, 17s. to 30s.; horses, £10, £20 to £30; mules, £12 to £20.

The "Frankfurter Zeitung" states the net profits of the Anglo-Swiss Condensed Milk Company for 1902, including the amount received from the sale of the company's American business, at 5,133,226 francs, as compared with 2,696,243 francs in the previous year. After providing for depreciation and reserve the directors propose a dividend at the rate of 60 francs per share, or 12 per cent, as in 1901. The share capital is to be reduced from 24,000,000 francs to 19,200,000 francs by the return of 100 francs per share to the shareholders out of the proceeds of the realisation of the American branch, the repayment to be effected on the 1st July next.

American buffaloes, though not extinct, are gradually disappearing. Before the white man's guns were heard in their haunts the buffaloes numbered over 10,000,000 head. Now the bison is on the verge of extermination. In a recent official report it is recorded that very few remain of the millions which once roamed over the plains of the West, and the only herds of wild buffalo which are in existence are in the Yellowstone Park and in Lost Park, Colorado. There are a few herds of domesticated and half-domesticated buffaloes in the hands of private individuals and in zoological parks. Possibly the U.S. Government will acquire possession of a considerable number of full-blooded buffaloes in order that the species may be perpetuated on the American plains. A few woodland buffaloes live and thrive in Canada, but they appear to be quite a different species.

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Judging at Shows.

THERE can be no doubt that the correspondence we publish to-day will be read with interest. A circular letter was sent to each Judge of the recent Maritzburg Show, asking for his opinion on the principal point raised in the article on judging at shows. That point was whether Judges could be obtained who would be competent, and willing to give their reasons, vocally or by points, or both, for their awards. On the whole, the tone of the

letters is hopeful. The object we have in view is that of making the Colony's shows more educational, interesting, and more attractive in gate money. In the correspondence, it will be noticed that other points of great importance are raised. These should receive the careful attention of all the executive committees of shows. In the hope that others may express their opinions on the main subject, we shall for the present reserve our comments.

Passing Notes.

SUPPLEMENTAL PAGES.—Again we have the satisfaction of presenting twenty-four additional pages. Much of the matter, it will be seen, is of the official nature which appears at the end of the Government year.

GOVERNMENT COLD STORAGE, MARITZBURG.—In this issue will be found an illustration of the Government Cold Storage at Maritzburg. A full description of the building and of the plant for producing the cold atmosphere was published in No. 21, Vol. V.

PASPALUM D. HAY.—A farmer writes concerning the *Paspalum dilatatum* (golden crown) grass to the *Australasian* as follows:—“Off thirty square yards of land under this grass I took 50lb. of dried hay (which will be nearly 11 tons per acre), being the second cutting this season, and will probably get as much from the third cutting. This piece of land has never been manured.” This hay has a high repute, and it is to be regretted that none in quantity is placed on the market. It is to be hoped that those farmers who specially lay themselves out for cutting hay for sale will soon give attention to this prolific and excellent grass.

GRADING OF CATTLE.—Owing to indisposition, we regret to say, Mr. E. O. Challis is not able to deal with the letters on this subject published in the last issue. He is quickly recovering, and hopes in a few days to be able to write his comments.

SINGLE JUDGES.—Mr. F. A. R. Johnstone, in responding to a toast at the Dundee Agricultural Show dinner, said:—“I should like to see one Judge to a class, instead of two or three as at present. If there are two or three gentlemen judging, we invariably find that one is stronger than the others, and he suggested the animal or article to which the prize should be given, and his suggestion was usually adopted. Let us have but one Judge, and if a mistake were made he had no shield; he

could not cover himself by saying there were other Judges.” The Single Judge system is already being adopted in the Colony, and it is to be hoped the practice will quickly extend. Much may be urged for the old system, but everywhere the new plan of single judging is rapidly making way. The leading show of the world, the Royal of England, after years and years of discussion, has finally adopted that of the “Single Judge.”

PRICE OF BUTTER.—Apparently some reduction in the value of Colonial butter is imminent. First-class brands may keep their prices, but other butter will find a strong competitor in imported produce. A firm in Durban has lately been busy advertising the prices at which it is willing to book orders for delivery in August. The prices are practically wholesale, but the quantities are not so large as to make it difficult for two or three householders to buy in combination. The quantities are either 56 lbs. or 52 lbs., and the prices are: Victorian “Woodside,” 1s. 2d. per lb.; “Crown,” 1s. 2½d.; “Crown,” 1s. 3½d.; and “Victorian Creamery,” 1s. 5d. per lb.; “Argentine,” first grade, 1s. 3½d. and 1s. 4d.; New Zealand “Inglewood,” 1s. 3½d. While the present price of cows in the Colony maintains, the competition of the imported article will be severely felt.

CANARY GRASS.—Ergates writes:—I recently met Mr. R. Ogram, of the Impendhle, and in the course of our conversation he said he had grown a small quantity of canary grass with much success. His locality is a cold one. He tried a small quantity last year, and this year he intends putting in three or four acres of it. In a climate similar to his, the seed should be put in during February, and as green fodder it will carry into the middle of August—a month later than barley. The seed, as retailed for feeding birds, generally costs 3d. per lb.: the price of Messrs. Pechey & Co. for

100 lbs. is 23s. The grass is a native of the Canary Islands; it is grown to a considerable extent in Europe and in the warmer parts of England, chiefly for seed for cage-birds. The grass grows to a height of about thirty inches. In Europe

the grain is esteemed for the nutritious and pleasant-flavoured flour which is made from it. On the recommendation of so experienced a farmer as Mr. Ogram, I think the grass should be worthy of a small trial for green fodder.

A Disc Plough Trial.

BY FRGATES.

DISC PLOUGHS are winning popularity in different parts of the world, and at the present moment they are attracting the attention of Natal farmers. Three or four demonstrations of these ploughs have been recently given in the Richmond district, and all have been well attended, with the result of orders being received by the agents of the different makers. On the 15th inst. I had the opportunity of attending a demonstration kindly arranged by Mr. John Moon, at his farm, near Manderston. Some sixty farmers were present, all of them taking keen interest in the demonstration. The ploughs were: The Syracuse, the Rotatory Dutchman, the Spalding Robbins, and the Rock Island. On the ground was also a disc plough of English make, but owing to disappointing preliminary trials this one was not inspanned. So far as I could gather, the Syracuse won the most favour, but it was also agreed that in guiding power it was deficient. In the guiding arrangements all the ploughs, with one exception, were more or less defective—a defect, however, not difficult to remedy. The Spalding Robbins, which had four discs, worked excellently, but was difficult to manage at the headlands.

The demonstration was useful in awakening attention to an important new implement, but the conditions of the trial were not all of a character to bring home generally the information an intending purchaser would wish to learn. The chief, or one of the chief, recommendations claimed for the disc plough is the lightness of haulage. This can only be tested by a dynamometer, which should be applied on the land to an ordinary three-furrow plough and to every com-

peting disc plough. Only the very roughest guesses of the hauling power exerted can be made by even the most experienced if guided only by the length and general appearance of the spans. The individual driver himself is a big factor in this question.

The character of the soil to be ploughed is also a matter for consideration. At the trial a three-furrow plough worked well, but the ground turned over was in big lumps, while the ground treated by the disc ploughs was sliced into small bits. Which would be best for crops to follow, soil effectively turned over and lumpy, which requires harrowing, or sliced up finely, can only be settled by experiments of some months' duration. In very hard land, in which an ordinary plough cannot be used—and there is plenty of such land at this time of the year in the Colony,—the disc plough would probably be of great service. For breaking up land the disc plough is not suitable.

English gardeners, according to a correspondent in the *Gardeners' Chronicle*, were very particular in selecting plants for seed. They go through their fields of cabbage, and place a stake against every plant that was hearting early; these would be gone over again two or three times, and all the indifferent ones removed, and only the very best left as seed producers. The hearts are eventually cut, leaving the stumps to stand, and in the autumn, when sprouts appear, these stumps are taken up and replanted deeply, leaving only the tips of the sprouts visible, and it is these sprouts which produce seed in the following summer. In this way fine stocks can be produced and bolting reduced to a minimum. Some who grow for seed take less trouble; they content themselves with sowing the seed in drills and leave them there to produce seed. But it is obvious this perhaps more rapid, but certainly less laborious process, can scarcely operate to secure the fine, pure, even stocks obtained by the more methodical process.

Stock Disease Laws of Natal.

Appended are the clauses of the Laws, etc., of Natal bearing on Stock Diseases. If the Laws, etc., are inaccessible in files of the *Government Gazette* or volumes of the Statutes, they may be obtained from the Times Printing and Publishing Co., Maritzburg.

LAW No. 13, 1866. (Animals Diseases.)

1. Governor may prohibit importation into Natal of all cattle; and order destruction thereof if imported.

2. Governor may award compensation for animals destroyed if not diseased; value to be fixed by two arbitrators or umpire.

3. Governor may admit imported cattle to quarantine on terms.

4. If disease breaks out in Colony, Governor may proclaim any portion infected, and order destruction of cattle therein.

5. Governor may proclaim rules, and impose penalty of £50; penalties may be prosecuted for in Magistrate's Court; *vide* Ord 16, 1846.

LAW No. 48, 1847. (Scab Law.)

1. Repeal of Law 12, 1882.

2. Governor in Council may appoint Inspectors; their powers; penalty for obstructing them.

3. Duties of Inspectors; License to keep infected sheep; Renewal of license; payments therefor; licensed sheep to be herded.

4. All sheep to be dipped during the first fourteen days of December in certain years.

5. Possession of sheep to be reported to the Inspector; penalty for default of false return.

6. Owner of infected sheep to give notice to Inspector and to neighbours; duties of Inspector thereon.

7. Return to be made to Inspector as per Schedule A; penalties for default or false return.

8. Compulsory branding of sheep and registration of brand; penalty for default; registered brand to constitute *prima facie* evidence of ownership.

9. Impounding of unbranded sheep running on certain lands; how such sheep are to be released.

10. Destruction of unbranded infected sheep straying or intermixing with other flocks when less than ten in number; if more than ten; if branded; liability of owner for expenses and damages; assessment of damage; notice to owner; procedure when sheep are unclaimed.

11. Flock held to be infected if one infected sheep be found therein.

12. Sheep infected or dressed for scab within three months not to be removed without authority of Inspector; when such authority may be given; duration of authority.

13. Sheep may be sold where ownership is denied or is uncertain, or where penalty is not paid within three days.

14. Penalty for importation or introduction of infected sheep, except in compliance with the law.

15. Establishment of dipping stations.

16. Governor in Council may appoint Inspectors at crossing places; their duties; penalty for obstructing Inspectors

17. On application, Inspectors to brand and dip sheep; charges for branding and dipping.

18. Sheep when branded and dipped not to leave station without permit.

19. Sheep arriving from over the border to be dipped.

20. Owner or lessee of land in Klip River County may bring his flocks across the border into that county once a year for depasturing in the winter without entering the Colony at a port of entry or dipping the sheep; proviso.

21. Dipping to be to the satisfaction of the Inspector.

22. Private marks on sheep; penalty for obliteration; registration of earmarks.

23. Salaries of Inspectors.

24. Proceedings, how instituted; disposal of fees and penalties.

25. One or more sheep to constitute a flock.

LAW No. 29, 1874. (Animals Diseases.)

1. Magistrate may authorise removal of carcasses.

2. Dead animals may be buried on farm adjoining the road, but not in cultivated land or near a house, or less than three feet below the surface.

LAW No. 9, 1893. (Scab Law.)

1. Reduction of dipping fees.

ACT No. 38, 1894. (Animals Diseases Act.)

1. Meaning of "stock" in Law 13, 1866.

2. Special laws not affected by Act.

3. Isolation of animals showing symptoms of disease; notice to neighbours and to Magistrate.

4. Enquiry and inspection.

5. Examination.

6. Isolation or destruction.

7. Diseased animal not to be removed; or driven or put on the road, etc.

8. Proclamation of infected districts.

9. Prohibition of introduction of stock from proclaimed countries.

10. Prohibition of importation of diseased animals.

11. Isolation of animals which have mixed with diseased animals.

12. Destruction of utensils, etc.; purification of buildings, etc.

13. Officers.

14. Regulations.

15. Compensation for destruction of animal which was not diseased.

16. Assessment of value.

17. Prosecutions.

ACT No. 21, 1895. (Scab Law.)

1. The law may be relaxed as to dipping in case of sheep imported in connection with shows, etc.

ACT No. 3, 1897. (Animals Diseases.)

1. Acts 1 and 34, of 1896, continued to 31st December, 1898.

2. Cattle breaking through fences may be seized and forfeited.

3. Punishment for wilful introduction of cattle diseases.

4. Forfeiture of property of offenders.

5. Definition of duties of Commissioners.

6. Interpretation of word "cattle."

ACT 30, 1897. (Lungsickness Prevention Act.)

1. Short title.
2. Repeal.
3. Interpretation.
4. Principal Veterinary Surgeon shall be responsible for carrying out provisions of Act and Rules, &c., thereunder.
5. Appointment of Inspectors with certain powers.
6. Appointment of Inspectors for Native Locations, and of other officers necessary for purposes of Act.
7. Offence of obstructing an officer in the execution of his duty.
8. License to keep infected herd; renewal of license; penalty for removing infected cattle.
9. On outbreak of lungsickness, or in case of inoculation, &c., owner to give notice to Magistrate or Inspector, and to neighbour.
10. Licensed cattle to be isolated by herding or otherwise.
11. Liability of owner for all damage caused by trespass of cattle from a licensed herd.
12. Destruction of infected cattle not being on their owner's land.
13. Remainder of such cattle not to be driven without first informing nearest Magistrate, Inspector, &c.
14. Application of Sec 12 to cattle seized, forfeited, &c., and to persons removing such cattle.
15. Public sales: implied warranty against lungsickness by Auctioneer or Marketmaster: exemption of Pound Sales.
16. Liability of vendor in public sales.
17. Private sales: implied warranty by vendor.
18. Recently inoculated or drenched cattle not to be brought to public sale.
19. Private sales: implied warranty against recent inoculation or drenching.
20. In action for damages, vendee to prove steps taken to prevent spread of disease.
21. Forms and proceedings to be followed and taken by vendee.
22. Landowner or occupier may destroy lungsick cattle found on his land.
23. Destruction of lungsick cattle found on highway, &c.
24. Compensation for destruction of healthy animals according to Schedule C.
25. Owners must confine infected cattle to their own land.
26. Declaration of lands as infected areas.
27. Governor may proclaim infected areas.
28. Governor may repeal or alter such Proclamation.
29. *Onus probandi* in cases of disputed ownership.
30. Lungsick cattle in public pounds to be destroyed.
31. Poundmasters must report outbreak of lungsickness in pound to Magistrate or Inspector.
32. Poundmaster to declare date of last case of lungsickness in pound before any sale.
33. Poundmasters' books.
34. Penalty on Poundmaster for neglect.
35. Governor may proclaim infected areas within commonages.
36. Destruction of cattle in Boroughs.
37. Penalty for introduction into Colony of lungsick or inoculated cattle.

38. Governor may prohibit introduction of cattle.

39. Rules and Regulations.
40. Rules and Regulations to be laid before Parliament.
41. Contraventions of Act.
42. Penalties.
43. Prosecutions.
44. Notice of action against officers.
45. General plea sufficient.
46. Plaintiff restricted to his notice.
47. Tender of amends or payment into Court.
48. Powers, rights, &c., additional to those conferred by any other Law.
49. Prosecutions not to affect civil remedy.

ACT No. 27, 1898. (Glanders Act)

1. Repeal of Law 14, 1887.
2. Interpretation.
3. Report of disease to be made by owner; inspection by Veterinary Surgeon.
4. Diseased animal not to be moved.
5. Offences of sending diseased or suspected animal by rail.
6. Such animal not to be sent to the Pound, but isolated on the premises: expenses to be reimbursed to person on whose premises another's animal is isolated.
7. Offence of offering diseased or suspected animal for sale.
8. Offence of taking infected animal on roads, outspans, &c.
9. Stray animal may be secured for purpose of inspection.
10. Report, isolation, and inspection.
11. Powers of Veterinary Surgeon or Stock Inspector to enter stable, &c., and inspect and isolate animals.
12. Powers of Veterinary Surgeon to apply tests and compel isolation.
13. Veterinary Surgeon may order destruction of infected animal.
14. Examination of carcass: compensation from Revenue in certain cases.
15. Isolation of "in-contact" animals.
16. Burning or burial of carcass, in boroughs or townships: offences of neglect to bury.
17. Liabilities of hotel-keepers for stabling infected animals or neglecting precautions.
18. Destruction of infected articles.
19. Purification of stables and premises.
20. Duty of persons keeping animals to allow inspection, etc., and to obey orders of Stock Inspector or Veterinary Surgeon.
21. Offence of knowingly allowing an infected or suspected animal to stray.
22. Duty of private Veterinary Surgeons to report suspicious cases.
23. Rules.
24. Punishment of contraventions.
25. Disposal of fines.
26. Offences cognizable by Magistrate.

ACT 40, 1898. (Animals Diseases.)

1. Sale of cattle implied warranty against Rinderpest.
2. Forms and proceedings to be followed and taken by vendee.
3. Act not to apply to sales of cattle under Pound Laws or to cattle which may have left the Colony.
4. Construction of Act.

ACT No. 16, 1899. (Glanders Act).

1. Section 14. of Act No. 27, 1898, entitled Act 'To make better provision for Preventing the spread of the Disease called Glanders,' shall be amended.

ACT No. 27, 1899. (Tuberculosis Act)

1. Meaning of "cattle."
2. Importation of "cattle."
3. Examiners.
4. Certificates of test ng prior to embarkation.
5. Quarantine.
6. Tuberculin test to be applied.
7. Disposal of cattle found to have tuberculosis.
8. Disposal of carcass.
9. Expense to be borne by owner.
10. Authority of principal Veterinary Surgeon.
11. Rules.
12. Obligation to comply with rules.
13. Cattle imported for slaughter.
14. Offences.

ACT 30, 1899. (Animals Diseases.)

1. The words "or to apply to any of the said diseases while any such special Law or Act shall be in force" shall be expunged from Section 3 of Act No. 38, 1894.

PR OCLAMATION No. 54, 1894. (Rabies)
Importation of dogs.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos 38 of 1894: 1, of 1896; 34, of 1896: and 3, of 1897. or of any Act

to be construed therewith, or of any Proclamation which may be issued thereunder.

PR OCLAMATION No. 43, 1900.

Principal Veterinary Surgeon, under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 8, 1901.

Regulations made under Section 39 of the Lungsickness Act, 1897.

REGULATION No. 506, 1901.

Under the Animal Diseases Act, 1894, no person shall introduce into this Colony any part or parts of an animal affected with, or having died from, the disease of Rinderpest.

PROCLAMATION, No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION, No. 36, 1902.

Under Law No. 13, 1866, and the Animal Diseases Act, 1894, importation of cattle prohibited from following countries:—The Colony of Rhodesia, the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana, in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston inclusive.

Implements at the Central Experiment Farm.

THE following is a list of implements now at the Government Central Experiment Farm, Reit Spruit, which will probably be of interest to Natal Farmers. These implements can be seen by anyone interested, and the Farm Manager, Mr. Alex Reid, will arrange for showing their construction and working. It is desirable to first communicate with him by letter, so that a date for visiting the farm may be arranged.—A.N.P., 18 7 03 :—

High Flyer Gang Plough.

Sub-Soil Plough.

Syracuse Hill Side Plough.

Rotary Dutch Plough, single and 3-furrow. Made in America.

Ordinary Double Board Riding Ploughs. Made in England.

Stump Jumping Plough : 3-furrow mould board. Made in Melbourne.

Spalding-Robins' Stump Jumping Disc Plough, 4-furrow. Made in Melbourne.

Spalding-Robins' Stump Jumping Disc Plough, 6-furrow. Made in Melbourne.

Osborne Cutaway Disc Harrows.

Peg Tooth Lever Harrows.

Ordinary Zig-zag Harrows.

Daisy Mealie-Planter (single row). Made in America.

Dere Mealie Planter (two rows), with check chain and fertilizer boxes. Made in America.

Buck-Eye Drill. Made in America.

Cultivators, Scufflers.

Martin's Cultivator. Made in England.

Mealie Husker (Scottish Chief).

Mealie Husker or Shredder (McCormick). Made in America.

Reaper and Binder, McCormick. Made in America.

Cambridge Roller. Made in England.

Forest Devil Tree Extractor. Made in Melbourne.

Pump-jack Tree Extractors. Made in Melbourne.

Lightning Vices.

ALEXANDER REID,
Farm Manager, C.E.F.

Annual Report of the Director of Agriculture.

A SUMMARY.*(Concluded.)***THE WORK OF THE DEPARTMENT IN 1902.****EXPERIMENT FARMS.**

THE year 1902 has been a busy one in the Department. The most prominent new work undertaken has been the establishment of a central experiment farm at Riet Spruit, half-way between Hilton Road and Howick. The work on this farm is already well-known throughout the Colony, and as it is intended to issue a separate report about it at the end of the season, it is unnecessary to burden this report with a lengthy description thereof.

The farm has already been planned out in considerable detail, and drawings prepared for various permanent buildings.

In designing the colleges and farm buildings the probable ultimate development of the farm has been held in view, and the plans so arranged that the buildings can be constructed in sections at a time.

Plans were prepared for laying out 2,136 experiment plots the first season; and 1,178 species and varieties of plants, including 40 species of forest trees and 160 species and varieties of grasses, were ordered from various parts of the world.

Owing to labour difficulties at a critical period it was not possible to put in all the plots, but about 900 have been laid out during the current season. Any statement here of the results would be forestalling the proper seasonal report; but these have been of an exceedingly striking character, and have attracted much public interest. The results, considering the dry season, have been in many cases very gratifying.

For the afforestation work at the farm a temporary nursery of 1½ acres has been laid out on the west side of the farm, pending the construction of

the water supply for the permanent nursery on the east side. A potting shed has been erected, and over 90,000 young trees had been pricked into tins before the end of the year.

Some necessary temporary buildings at a minimum of expenditure have been erected, and brick-making for the permanent buildings put well in hand.

It gives me pleasure to be able to state that the whole of the farm staff have worked well and to the satisfaction of the Department, and the fact that a new staff has settled down to work together with the minimum of friction reflects credit on the tact of Mr. Reid, the Farm Manager. Mr. Whelan, with his usual enthusiasm, has specially exerted himself to make the experimental work a success.

Two blocks have been set apart at the Weenen Irrigation Settlement for experiment and demonstration in irrigation, tobacco growing and curing, and fruit preserving and packing, and other industries appropriate to the settlement. Steps were initiated but not concluded in 1902 for selecting the site of a coast experiment farm.

DIVISION OF ENTOMOLOGY, ETC.

This division is under Mr. Claude Fuller, whose chief administrative work during the year 1902 was the initiation of an organized campaign against locusts under the powers conferred by Act 33 of 1895. In the early part of the year the destruction of locusts of the season 1901-2 was left to voluntary action, the work of the Department being confined to gathering information as to the whereabouts of the pest, and to supplying pumps and material for its destruction. The assist-

ance of the Department was freely accepted by up-country farmers, but from the coast districts, more especially the South Coast, practically no action was taken by the residents. This fact led to a request being made to the Minister by Coast representatives that the Department should undertake active operations and enforce Act 33 of 1895. As a result Mr. W. H. Bushby was appointed in August to the position of Chief Locust Officer as provided by the Act; and was placed in the Entomologist's Division; rules and regulations under the Act were drafted, and were promulgated in Government Notice 621 of 1902, and attention was drawn to them several times in the newspapers. These regulations required amongst other things that all occupiers of land should furnish information as to locust swarms laying eggs. This information was to be received and collated by the Chief Locust Officer as a guide to his subsequent operations. Many reports were received, but a great many which should have been sent were not forthcoming. From those received a map was prepared showing the distribution of locusts through the country; and in November and December, towards the hatching season, temporary District Locust Officers were appointed to destroy locusts in Crown lands, and to call upon all parties concerned to undertake the necessary measures of Destruction. Pumps and material were supplied by the Department.

Excellent work was done in several districts by private individuals as well as by the officers; but the latter were hampered in many cases through the insufficiency of the information supplied in the first instance, and also through the unwillingness of several of the inhabitants, European as well as Native, to perform their share of the work. In some instances it has become necessary to institute prosecutions. It is desirable that the public should understand that the active campaign lasts for only about three months, and that during this period work has to be

carried on under great stress and strain; and its success depends largely upon the fulness of the preliminary information, and upon the prompt concurrence of all concerned in the active work. If this concurrence is not rendered readily, there is no option but to enforce it by law.

The difficulties in the way of conducting a campaign in Zululand made it impracticable to do much there during the past season; but this being probably the principal breeding ground of the Colony, special attention will be paid to it during the coming season.

If the systematic work of the Department be adequately supported by law, the locally bred swarms in Natal may be reduced to practically insignificant dimensions; and Natal will then be in a position to move for inter-colonial or federal action throughout South Africa.

A full report by the Chief Locust Officer of the 1902-3 operations will be published separately.

In his important work of investigation into insect pests and parasitic fungi of the Colony, Mr. Fuller is progressing with his usual skill and thoroughness. The subjects which he has in hand are the potato blight, the mealie grub, fruit moths, orange moulds, rhubarb blight, the fruit fly, and rust in forage. A special bulletin embodying the latest results of this work will be published during the coming winter. During the year Mr. Fuller has published a second report of his investigational work in Natal, a bulletin of Fruit Growing, and a paper read before the Natal Farmer's Conference, entitled "The Official Entomologist." All these have been well received by the public. In his second report Mr. Fuller published the draft of a proposed Bill for the suppression of insect pests and the diseases of plants. This Bill, which was based on the best legislation of a similar kind in other countries, is worthy of consideration and discussion.

During the year the Entomologist paid 80 official visits to farms and

A VICTORIAN HERD. —Continued.

No.	Names.	Milk.	Test.	Butter.	Price.	Value.
		Gallons.		lbs.	d.	£ s. d.
11	Bawley ...	619	3·6	245 12	8	8 4 0
12	Mary Ann ..	662	3·3	239·64	8	7 19 9
13	Jenny ...	670	3·2	234·89	8	7 16 7
14	Blossom ...	666	3·2	233·49	9	7 15 7
15	Polly ...	587	3·6	233·38	8	7 15 7
16	Snaily ...	521	4·0	231·27	8	7 14 2
17	Judy ...	502	3·8	211·44	8	7 0 11
18	Rosy ...	594	3·2	208·24	8	6 18 9
19	Lady ...	435	3·9	188 13	8	6 5 9
20	Bonny ...	430	3·9	185·97	8	6 3 11
21	Dolly ...	421	3·8	177 32	8	5 18 2
22	Molly ...	392	4·0	174·01	8	5 18 0
23	Matilda ...	492	3·2	172·48	8	5 14 11
24	Liz ...	399	3·8	168·05	8	5 12 0
25	Princess ...	409	3·7	167 28	8	5 11 0
26	Betty ...	385	3·9	166 56	8	5 11 0
27	Cherry ...	375	4·0	166·48	8	5 10 11
28	Nelly ...	471	3·2	165·12	8	5 10 0
29	Violet ...	359	3·8	151·20	8	5 0 9
30	Gloss ...	347	3·8	146·15	8	4 17 5
31	Redmond ...	365	3·6	145 11	8	4 16 8
32	Pansy ...	299	3·7	122·29	8	4 1 6
		16 658		6,886 79		229 10 0

In the above herd, the average weekly yield of milk per cow throughout the year was 10 gallons, and the average weekly yield of butter was 4lbs. 2½ozs. For improving the herd it would be

desirable to send the progeny of the last four cows, and, preferably, of the last nine, to the butcher.

The following is another record of a smaller herd:—

TABLE OF MR. HOLLIER'S RETURNS FROM EIGHT COWS IN 1897.

MONTH				Milk.	Test.	Butter.	Value.		
				Gallons	per cent	lbs.	£	s.	d.
January ...	...	...	...	616½	3.6	242½	7	7	
February ...	...	...	...	598½	3.7	252	7	17	0
March ...	...	...	...	732	3.6	320	8	13	4
April ...	...	...	...	730	3.6	298½	8	1	8
May ...	...	...	...	664½	3.7	280	0	10	0
June ...	...	...	...	524	3.6	214½	10	14	6
July ...	...	...	...	337	3.9	150	9	7	6
August ...	...	...	...	247	3.9	110	6	17	6
September ...	...	...	...	235½	4.2	113½	4	4	0
October ...	...	...	...	343	3.9	152½	4	15	3
November ...	...	...	...	509	4.0	232½	6	15	7
December ...	...	...	...	530½	3.8	23	6	14	2
Totals ...	...	...	...	6117½	...	2606	91	18	5
Bonus ...	...	...	...	...	...	...	7	17	2
Total Amount received for Milk ...				...	...	...	99	5	7
Average value per cow ...				...	...	...	£12 8s. 2½d.		
Average yield of Milk per cow ...				...	...	...	764½ gals.		
Average return of Butter per cow ...				...	...	...	325½ gas		
Average yield of Butter per cow, weekly ...				...	...	...	6½lbs.		

The above results are the outcome of improving common dairy herds. But they do not represent the highest standard attainable in practice. The British Dairy Farmer's Association's standard for entry in the *Dairy Cattle Register* is, for Short-horn Cows, 8,500 lbs. (825½ gallons) of milk in the year, and 1½ lbs. of butter a day or 8¾ lbs. a week. That this is an unattainable standard at present in Natal everyone will admit; but still there is a great difference between 1½ lbs. of butter a week and 8¾ lbs.

In connection with factories, the following statement of the half-yearly balance sheet of a Victorian butter factory may be of interest to Natal factory directors. Such results, as Mr. Challis points out, are unattainable in Natal at present; but with closer settlement, improved dairy herds, and better feeding and winter treatment, the capital and working expenses of factories here would be greatly reduced.

STRATHBOGIE DAIRY COMPANY LIMITED.

Balance Sheet for the Half-year ended 30th April, 1897.

LIABILITIES.		£	s.	d.
Authorised Capital	...	£1,000		
To Subscribed Capital	...	£1,000		
" Less Uncalled	...	£500		
			500	0 0
" Reserve Fund	...	...	600	0 0
" Refrigerator Reserve Fund	...	...	130	0 0
" Sundry Creditors for Milk...	...	...	284	5 3
" Sundry other Creditors	...	...	60	4 0
" Profit and Loss	...	...	379	16 9
			£1,954	6 0

ASSETS.		£	s.	d.
By Balance of Cash Account	...	181	1 0	
" Unpaid Calls and Premiums	...	97	0 0	
" Sundry Debtors for Butter	...	14	1 0	
" Lands and Buildings	...	219	13 0	
" Plant	...	818	8 0	
" Stock of Cases	...	38	18 0	
" Stock of Sundries at Cost Price...	...	48	0 0	
" Estimated Value of Butter in Agents' hands, also of Surpluses on Export Butter	...	537	2 0	
			£1,954	6 0

PROFIT AND LOSS ACCOUNT.

LIABILITIES.		£	s.	d.
To Working Expenses, being Wages				
Salaries, Fees, Manufacturing				
Materials, Firewood, Freight				
Insurance, etc.	...	417	7 10	
" Export Cases	...	101	18 8	
" Debts written off as bad	...	0	15 9	
" Balance	...	379	16 9	
			£899	19 0

ASSETS.		£	s.	d.
By Balance from last Account	...	23	11 0	
" Sales of Butter-Milk	...	7	0 0	
" Interest on Unpaid Calls and Premiums	...	1	3 0	
" Balance of Produce Account	...	868	4 0	
			£899	19 0

PRODUCE ACCOUNT.

LIABILITIES.		£	s.	d.
To Stock on hand last Balance	...	538	0 0	
" Milk purchased	...	3,289	15 2	
" Balance	...	868	4 9	
			£4,695	19 11

ASSETS.		£	s.	d.
By Sales of and Advances on Butter	4,158	17 0		
" Estimated Value of Butter in Agents' hands and at the Factory, also on Surpluses on Export Butter	...	537	2 0	
			£4,695	19 0

Insulated and iced vans have during the year been attached to certain passenger trains for the conveyance of dairy produce. These vans were constructed in accordance with experiments devised by me and carefully carried out by the Dairy Expert, who at one time was assisted therein by Mr. Parady, the Department's Officiating Analyst at Durban. The thanks of this Department are due to the Railway Department for facilities provided for the conduct of these experiments, and for the excellent manner in which the vans were constructed. Unfortunately the vans have proved too small to accommodate the produce, and it will be necessary to ask for the fitting up of full-sized insulated cars.

The Maritzburg and Durban public are to be congratulated on the introduction by the two Natal Creamery Companies of a hygienic and reliable milk supply. It is to be hoped the time-honoured Kafir milk-bottle will soon be a thing of the past. Nothing could better contribute to its speedy dispatch than the wholesale distribution in pamphlet form of the Dairy Expert's graphic remarks concerning it, coupled with his most interesting description of the milk supply in Toronto.

This description will be found in a general resumé of his tour in Europe and America, a resumé which forms very interesting reading. His remarks concerning the Toronto City Dairy Company, and the egg industry in Denmark, are of special interest.

CHEMICAL WORK.

There is at present no Chemical Division of the Department, but Mr. Alex. Parady, who was originally engaged to take charge of the plant for fumigating fruit trees, has been relieved of the fumigating work, and has devoted the whole of his time to officiating as Analyst to the Department. For this work he has been kindly accommodated by Mr. E. Nevill, the Government Astronomer and Analyst, with a room and the use of apparatus in his laboratory at Durban. It is intended to build a laboratory on the Central Experiment Farm for the Chemical work of the Department.

Mr. Parady during the year analysed 37 soils, 57 manures, 6 limestones, 5 minerals, 3 limes and 2 ashes. The most important part of his work was the manure analysis and the preparation of a bulletin on the

manures in the Natal market. This bulletin has been well received and appreciated by farmers, and it is intended to make it an annual production. The prices of manures have been already brought down considerably. The importance of the manure trade to the country is very great, for the crop growth depends largely thereon. An effective check on the quality of manures is of high importance, and is in the interests both of the farmers and of the manure merchants themselves. Farmers should never purchase manures except on guaranteed analysis. They can always have their purchases sampled by the Department's Analyst, and analysed gratis. If the quality is shown by the analysis to be not equal to the guaranteed standard, it is then open to them to claim compensation.

Mr. Parady's reports on soils have been accompanied by useful advice given by him, and the Department has received several letters of thanks for these reports.

In addition to his other work, Mr. Parady for a time assisted the Dairy Expert in his experiments connected with the construction of cool vans for the carriage of dairy produce on the railways.

INTRODUCTION OF SALMON AND TROUT.

Mr. J. C. Parker has continued his voluntary labours in connection with the introduction of American Rainbow Trout into the Natal rivers. He reports that during the year fry were distributed as follows:—

To Camperdown Reservoir	...	1,000
To Eland's River, Boston	..	500
To Ladysmith Reservoir...	...	150
To Mooi River (Hlatikulu)	...	350
To Reit Vlei (died on journey)	..	250
To Lion's River (Methley)	...	200
Remaining in hatching box for		
Tatworth	...	75

He reports also that applications for trout next season have been received from Mr. Latham, Dr. Gubbins, Mr. Peel (Ixopo), and the Corporation of Maritzburg.

The Department is under obligations to Mr. Parker for his continued interest in this useful work.

"AGRICULTURAL JOURNAL."

The report of Mr. H. R. Shaw, the Editor of the *Agricultural Journal*, is submitted herewith. No important change has been made in the *Journal* during the year, but the Editor is endeavouring to gradually introduce improvements, so as to increase its usefulness and popularity. The question of changing it from a fortnightly to a monthly periodical, and of altering it to the standard size of such journals has been discussed.

CLERICAL WORK.

For the sake of economy the clerical staffs of the Department of Agriculture and of the office of the Secretary to the Minister of Agriculture have been amalgamated, so as to admit of an advantageous classification and distribution of the papers and duties amongst the different members of the staff, and to enable one register to serve for both. Mr. E. T. Mullens, the Secretary to the Minister, readily co-operated in this arrangement.

I should here express my personal obligations to Mr. Mullens, who, at a time when a painful affection of one eye prevented me for some weeks from either reading or writing, most kindly

assisted me with the numerous papers that had to be dealt with.

The office staff generally have worked most willingly, and have assisted materially in the success of the year's work. For several weeks together they have ungrudgingly worked overtime.

CONCLUSION.

It is not usual in an official report of this kind to bring forward the personal element, but as this has been my first year in the Department in South Africa, I would like to say that the taking up the reins of office as Director of Agriculture in this new country has been no easy task. It has been one in which no man could hope to succeed to the entire satisfaction of himself and others. But my efforts have not been unappreciated; and in all the varied matters which have had to be mastered and dealt with, it has been my one aim to study, without fear or favour, the true interests of the country, to maintain the Department in a state of efficiency, and to make its operations a credit to the Minister, of real use to the country, and a satisfaction to all engaged in the work.

A. N. PEARSON,

Director of Agriculture.

Department of Agriculture, Natal.

29th May, 1903.

Dipping Tanks.

WE have received several requests to republish some of the information which has already appeared in the *Agricultural Journal*. The Government offers assistance on the £ for £ system towards the cost and maintenance of dipping tanks. In the next issue we shall reproduce the views expressed by Mr. G. D. Alexander upon the Nel's Rust Tank. The following is taken from No 9, vol. vi.:—"On the opposite page we give an illustration of a cattle dipping tank at Mr. P. Otto's farm, Somerville, Riet Vlei. The tank and its adjuncts, as will be seen, closely resemble the tank and yards at Nel's Rust, of Mr. Joseph Baynes, M.L.A., photographs and a plan of which were published in the last volume. Mr. Otto's dipping yard and the superstructure of the tank are constructed of 4 by 4 inch Jarrah wood for

posts, and 3 by 3 inch pitch pine rails. The flooring of the dripping yard is concrete. The tank, or bath, is built of whinstone laid in cement, and the backing is of well rammed clay. The face is cemented throughout. Wattle wood, charred and tarred, is used for the collecting yard and crush pen. Mr. Otto has already twice dipped all his horses and cattle with perfect success, but if he were building another tank, he says, he has come to the conclusion that he would not have the 5 feet 6 inches drop, but let the animals slide in, and for the immersion of the heads he would have a native post'd about half way down the tank, whose duty it would be to shove below the surface with his foot the heads of the animals as they swam by. The cost of all complete, with chemicals enough for a couple of tanksful, came to about £150.





Not Subsoiled,
Not Cultivated,
Not Manured

Not Subsoiled,
Not Cultivated,
Manured.

SWEDS ON 2 CULTIVATION PLOTS. HILL SOIL.
CENTRAL EXPERIMENT FARM, 1903.

Locust Destruction, 1902-1903.

REPORT OF THE CHIEF LOCUST OFFICER.

THE Government having been approached by various members of the farming community, with a view to having the "Locust Acts" put in force throughout Natal and Zululand, it was decided to appoint a Chief Locust Officer, and in December of last year, the work of organizing a systematic campaign against the pest, especially in the "hopper stage," was commenced. Rules and Regulations 621, 1902) were drafted and duly appeared in the "Government Gazette," and copies of the same, together with Acts 33 of 1895, 30 of 1898, and 42 of 1901, were forwarded to all Magistrates, Stock Inspectors, Forest Officers, and, through the Chief Commissioner, to all District Officers of the Natal Police; with a covering letter, requesting that all information in connection with the movements of flying swarms of locusts be communicated to the office of the Government Entomologist. Notices, moreover, appeared at intervals in all the daily papers calling public attention to the Rules and Regulations, and the liabilities thereby imposed. The movements of the flying swarms were duly recorded, and a chart kept, showing dates and direction of flight. The information furnished in this respect was not nearly so complete as could have been wished, and general apathy on the part of the public, and in many official circles, has been manifested throughout the whole of the season's campaign; and this, in addition to somewhat unfair criticisms, has made the work at times somewhat disheartening.

From representations made by the Government Entomologist, the Government indented to America for 60 spray pumps, and to London for arsenic, as it had been decided to use the arsenic solution for the destruction of the young locusts. The following is the formula generally adopted by the District Locust Officers, and which proved in all cases, most efficacious:—

1 lb. of arsenic.
 $\frac{1}{2}$ lb. of soda (washing).
 4-5 lb. common sugar or treacle.
 16 gallons of water.

Boil ingredients for a quarter of an hour in 2 gallons of water, then add the remaining 14 gallons of water.

It was found necessary, towards the end of the season, when the locusts were more fully developed, to make the solution somewhat stronger, but the general opinion was unanimous as to the effective results obtained. It may be mentioned that this solution has been found quite innocuous to stock, except in two instances. In one case, pigs, and in another, a dog, gained access to the solution, when in tins ready for spraying, with fatal results.

Advertisements were put in all the papers, inviting applications from persons willing to undertake the duties of district Locust Officers, and in the course of about three weeks close on 200 were received from all parts of the Colony and Zululand. The principal qualifications asked for were knowledge of the native habits and language, and also of the country. Out of the applicants, 14 district Locust Officers were, from time to time, appointed as occasion required, the country thus officered comprising the coast belt from the Tugela to the UmTamvuna.

In view of the fact that the amount placed on the estimates for the current financial year did not exceed £500, it was manifestly impossible to include the Province of Zululand in the plan of campaign this season, and, in fact, authority had to be obtained for a considerable excess on the vote, to enable the work to be carried on in Natal.

The duties of the district officers were as follows:—Each officer was placed in charge of a district, and where there were Native Locations and Crown Lands in such district, such officer was responsible for the destruction of young locusts

thereon, being supplied with materials for such purpose, together with such native labour as was necessary for the proper carrying on of the work. In addition to the above, it was his further duty to see that private individuals were taking the necessary steps to destroy young locusts on their lands. At the commencement of December last—the egg-laying season of the locust—throughout such localities (from which, judging by reports of flying swarms, it was deemed likely that the depositing of eggs had taken place), native runners were employed, through Magistrates, to locate, as far as possible, such depositing grounds, and to find out approximately the date of laying. Except in the Alexandra and Lower Umzimkulu divisions, this system showed very poor results, either from the fact that the natives employed, being unreliable, neglected their work, or that what information they did collect, was purposely withheld for fear that the natives in the districts, where it was discovered eggs had been laid, would be called upon to assist the Government in the destruction of the young locusts on their appearance, and without remuneration, although the fact remains that the safety of their crops depended on their collaboration.

The attitude the native assumed in connection with the work of locust destruction varied according to the several districts, where his co-operation was called for. The native in the districts adjoining the towns, more especially in the case of Durban, showed no inclination to assist the officers in their duties, and where it was necessary to obtain hired labour, the rate of pay worked out at about 85 per cent higher, than in those districts further remote from so-called civilization. I would here mention that if this work is to be continued next season, and is, as it should, to embrace the Province of Zululand, it will be absolutely necessary that the natives be given to understand that their services must be at the command of the Government in this connection, and that

they are not to expect any remuneration therefor, and the District Officers must be invested with such powers as will enable them to punish offenders on the spot through the chief. This is the more necessary, in view of the fact that in the locations the work carried on is almost invariably in a remote part of the country, and many miles from any Magistracy, and where it is necessary for an officer in every case of insubordination or the like to appear before a Magistrate to make a deposition; and again when the case comes on for trial, the loss of time is immense. Seeing that the season for the destruction of young locusts is but a little more than two months, it is most important that every day should be utilised in the actual work of destruction. For this reason officers have taken no action, where otherwise they would have done so, deeming it better that the offenders should go unpunished rather than that they should sacrifice valuable time in taking the case to Court, with but a faint probability of obtaining suitable sentences. I cannot put too strong a stress upon this question of native co-operation, as before stated, seeing that in the coming season, with the question of carrying the campaign into Zululand and possibly the new territory, it is a *sine qua non* to the success of the undertaking. In compelling the native to add his quota to the general work, Government is only asking him to assist in preventing his own crops from being demolished, and does not require him to work outside his own district.

The first District Locust Officers were appointed on the 20th December last, and commenced operations immediately, but in some cases great inconvenience was caused through the delay, on the part of the Railway, of the transport of the pumps and materials, in spite of the fact that the General Manager of Railways had given instructions that such materials were to have every facility for early despatch. There was also considerable difficulty in locating the hoppers, especially in the earlier stages of hatching, as the information to hand

re the depositing of eggs was most meagre, and individuals generally did not take the matter seriously, until such time as young locusts were discovered on their own property, the Acts, and the Rules and Regulations bearing thereon, notwithstanding. It is a matter for comment that, with very few exceptions, there were no reports *re* the depositing of eggs from private owners. However, on the appearance of the young locusts, greater activity was apparent, and in the majority of cases, owners commenced operations of their own free will, without waiting to be warned by the District Officer. There has been a tendency in a number of cases to look for too much assistance from the Department. Under the Act no arrangements were made for such, and the main object of this Department was, as already pointed out, to destroy the pest on Crown lands and Native Locations. It was thought advisable, however, in certain cases, to afford help by the loan of pumps, etc., and on occasions, for the district officer to personally superintend the work on private lands. This was, of course, the practice in districts where the officer was not engaged on destruction on Crown lands and Native Locations. In these latter districts, considerable difficulty was experienced in convincing the natives that the arsenic solution used would be quite harmless to their stock, fowls, &c., but after practical experience had satisfied them on this point, they appeared more willing to render assistance, although some of the tribes occasioned trouble by refusing to work. One great drawback, on account of the dry season this year, was the difficulty experienced in getting sufficient water, and frequently it had to be carried distances of two miles and over, to the spot where the destruction work was progressing. At a future time, in company with other suggestions for the better carrying out of the Act, this matter of the transport of water will again be brought up. In the meantime it is sufficient to state that this was one of the principal

difficulties to be met with. As the young locusts increased in size, they were the more easily located, and it was soon found necessary to add to the number of officers, and extend the sphere of operations. With regard to the work done in the various districts, the following details may be of interest.

DURBAN COUNTY.

In the above there were four officers, and towards the latter part of the season, a further officer was appointed, bringing the total up to five. In most cases the work done in location lands was excellent, especially in the northern Umlazi and Lower Illovo districts, where the officers practically cleared the country. There appears in one or two instances to have been a certain amount of friction between individuals and the officers, and some bitter things were said and written, with which it is not my intention to deal here, seeing that the matter has been taken up officially elsewhere. I may, however, mention that the officers were acting under explicit instructions, which they carried out to the entire satisfaction of this department. In the northern portion of the county, the work was not so satisfactorily carried out, this being in a great measure due to the fact that the occupiers are largely composed of small European holders and Indians. The former generally complained of the inability to obtain the necessary labour to carry out the work of destruction, and such assistance as was possible was rendered, by the loan of materials and the like. In the case of the Indian, it was deemed inadvisable to allow them control of the crude Arsenic, so that the officer was instructed to superintend the mixing of the solution, and its distribution. Here, again, complaints were received from one or two sources, to the effect that nothing was being done to destroy the young locusts, and prophesying devastation to crops when the hoppers arrived at the adult stage. A personal inspection with the officer of the district, soon after the locusts commenced to fly, afforded proof that

matters were nothing like so serious as had been represented, and I had pleasure in making a report accordingly. From my own observations, during my tours of inspection, I have come to the conclusion that the people of Durban County have cause for congratulation on the result of the steps taken by this Department in connection with locust destruction, with regard to themselves, seeing that their individual action does not compare favourably with that of the rest of the Colony.

INANDA AND INDWEDWE LOCATIONS.

Turning to the infested belt of country on the North Coast, officers were appointed for the districts between the Umgeni and the Umhloti rivers, and the Umhloti and Tongaat rivers. It soon became apparent that young locusts were swarming in these districts, despite early and convincing reports to the contrary, and heavy work devolved upon the officers in charge. Taking the northern district first, with the co-operation of the principal planters, excellent results were obtained, and but a small proportion of the hoppers attained the adult stage, the results of the campaign giving general satisfaction.

In the case of the southern district, from the Umhloti to the Umgeni river, at the commencement of the campaign, a certain amount of antagonistic feeling was met with by the officer, which rendered his work the more arduous, in the face of the facts that, in addition to the country swarming with locusts, the difficulty of obtaining labour was very great, and there were numerous Indian holders in the district. It is a matter to be deplored that the influential owner is at times found to be averse to carrying out his part of the work, and that it should be necessary to bring pressure to bear ere he will contribute his share. Examples of this kind do not tend to improve the *morale* of the smaller holders, Indian or Native, besides adding considerably to the difficulty of carrying out a scheme which is to benefit all, the time for which is so limited. The energy

and firm attitude of the officer eventually enabled him to practically clear his district, which is the more commendable in the face of serious odds.

Two officers were appointed for the Indwedwe native location, as soon as it became known that young locusts had made their appearance there, and satisfactory results were obtained, the work being carried out in extremely rough country, the question of water again being a serious one, and the assistance rendered by the natives leaving much to be desired. However, carrying the campaign into this district, practically included the infested area on the north coast belt, and established the good work done south of the location.

IXOPO.

On representations received from one of the leading residents in the Alexandra division, it was found necessary to appoint an officer to take charge of the location, in the Ixopo division, adjoining the northern boundary of the Alexandra County.

This action was justified by the fact that several swarms of hoppers were found in the locality, showing every indication of travelling in a southerly direction, which meant that eventually they would invade districts which were practically clear. For the period this officer was engaged, which was of short duration, very good results were obtained, and the Department owes a debt of thanks to the individual who took sufficient intelligent interest in the good working of the campaign, for giving such information as insured the county around being practically cleared. Having completed the work in the Ixopo division, the officer crossed the border, and, working in conjunction with the officer in the Alexandra district, by the time the remnant of the locusts were on the wing they had destroyed the greater portion of them.

ALEXANDRA COUNTY.

Two officers were appointed for the districts between the Umkomanzi river

and the location south of the Umtwalumi river. The senior officer-in-charge who had already some experience of the destruction of locusts, experienced valuable assistance from the planters in the district, and having explained the steps the Department intended to take, found little difficulty in obtaining the co-operation of the native. A short time after operations had commenced, however, owing to the general unrest amongst the natives in the locations, certain depôts were closed down, and for about a fortnight the work of destruction was seriously retarded. Matters having become more settled, the work was resumed, and before the flying stage was reached, the majority of the hoppers had been accounted for. As far as is possible to ascertain, the number of swarms destroyed by the Department and individual exertion throughout the division, would amount to between 80 and 85 per cent., which, considering the many difficulties attendant upon the campaign, appears a most satisfactory result. Shortly after operations, it became necessary to summons some natives for refusing to comply with the officer's requirements, and they were found guilty by the Magistrate. The first European to be summoned under the Act was a private individual in this division, who had been repeatedly warned by the officer as to the necessary steps to be taken in regard to young locusts on land occupied by him, but no action was taken by him in the matter, and he was accordingly summoned to appear before the Magistrate, who found him guilty, and fined him £1. Taking into consideration the general satisfaction expressed by some of the leading planters and others, it can be confidently stated that some of the best work has been done in this division, and it is also a pleasure to record that the action of the Department in this case appears to have been thoroughly appreciated.

ALEXANDRA AND LOWER UMZIMKULU.

An officer was appointed to preside over the district between the Umtwalumi

and the Umzimkulu Rivers, comprising some of the roughest country that had to be negotiated during the season's campaign. It was impossible, at times, to use any other means of transport than native runners, and when it will be remembered that tents, food, material, and water, had to be carried long distances over very precipitous ground, the difficult nature of the task will be readily understood. The officer, moreover, experienced in certain districts great reluctance on the part of the natives to assist him, and in many cases had to rely entirely on his own natives, both for transport and the carrying out of the work of locust destruction. Between the Umtwalumi and Umzumbi rivers the work was extremely heavy, and it was considerably over a fortnight before this part of the country was clear. Along this valley there are several natives, actually renting or owning farms, thousands of acres in extent, who showed that lamentable apathy so pronounced in the independent Kafir, as to laugh at the idea of killing young locusts on their lands; and it was not before pressure was brought to bear, that they commenced operations, and then in most cases in a half-hearted sort of manner. In the case of one chief who had been repeatedly warned, and had been promised assistance by the officer, and still took no action, a summons was issued, and he was brought before the magistrate. I was asked by the district officer if a lawyer might be retained for the case, on our behalf, as it was feared the Act was faulty. To this point I shall have further occasion to allude. I submitted the request, through the usual channels, but was informed that it could not be granted. The native chief, above-mentioned, was defended by a lawyer, and through some technical error in the drawing up of the summons, was acquitted. I here venture to express an opinion, that, had the case been placed in the hands of a competent lawyer, this would not have occurred, and the Department would have won, instead of lost, the case.

What such a result as this will have upon the native mind will be readily appreciated by those who have an intimate knowledge of their habits and customs, and unless some stringent rule is laid down and impartially enforced, the trouble we have experienced this season will be nothing to that we shall have to battle with in the future. In addition to his location work, this officer had several large estates on the Umzimkulu River to inspect, and although in some cases owners readily fell in with his wishes, in others there was again the disinclination to treat the matter as a serious one, and it was currently reported that the Government would not take action against proprietors of large estates, and who might possibly carry weight in the political arena. I may here mention that it was suggested, in connection with the above, that examples should be made of those individuals who have not destroyed young locusts to the satisfaction of the officer, and the matter was eventually placed in training, but at the time of writing the cases were still *sub judice*. The work done in this district, under very trying and disadvantageous conditions, has been most praiseworthy, and had the co-operation been given by all classes of the community, which in some cases we had a right to expect, and in others a hope that such might be granted, the results would have exceeded that of any other division.

LOWER UMZIMKULU.

Reports of young locusts having appeared in the location between the Umzimkulu and Imbagane rivers, an officer was appointed for this district, and despite the fact that native labour was difficult to obtain, succeeded in doing very good work. Had the information been received earlier the results would have been more satisfactory; however, defects of a similar nature should be easily remedied in the future.

EXPENDITURE.

The sum of money expended on Locust Destruction work, for the season 1902

1903, amounting to nearly £1,650, included officers' salaries, native wages, purchase of sugar-treacle, &c., transport and sundries, together with the cost of spray pumps (£181 13s. 0d.), and arsenic and soda (£265 11s. 4d.). The following table will give some idea of the proportionate amount expended by each officer.

	£	s.	d.
Stock in hand.			
Pumps (£20 deducted for depreciation, &c.) ...	161	13	0
Arsenic and Soda ...	200	0	3
Sundries ...	25	0	0
	386	13	0
Total amount expended	1,650	0	0
Less value of stock on hand	386	13	0
	£1,263	7	0

From this statement it will be observed that an amount of £1,263 7s. 0d. is to be divided amongst the 14 officers, giving an average of £90 per head. The total number of swarms destroyed by officers of the Department amounted in round numbers to 3,050. In taking these figures into consideration, it must always be borne in mind, that the officer's time was not wholly devoted to actual destruction, as in many districts the main work consisted in seeing that private individuals were taking the necessary steps to destroy on their own property, work that in many instances was of a most arduous and irritating nature, and in cases of this description the number of swarms destroyed would be comparatively small to the number destroyed in districts where the whole time could be given to the work. A case may here be quoted, where an officer in a certain native location, giving practically his whole time to the work of destruction, in 6 weeks destroyed 272 swarms of young locusts at a total cost of £69 7s. 3d., which equals within a decimal 5s. 1d. per swarm. Seeing that in many cases the swarms cover from one to two acres of ground, I think the above figure,

speaking for themselves and need no further comment. It is, of course, impossible to give returns of destruction work by private individuals, but that this has been very largely in advance of other years, will be admitted by all who reside in the infested areas, a fact which is in no small measure due to the energetic supervision of the officers. The fact must not be lost sight of that this is the first year that any attempt has been made to combat the locust pest in a systematic manner in the infested areas, and many things have had to be learnt by experience, which, although at times costly, is the surest road to attaining such a pitch of perfection, as will even insure the passive acquiescence of the inevitable malcontent, if not his active co-operation.

In conclusion, there are a few points I would touch upon, some of which may be of service in the coming season, and will, I trust, have the favourable consideration of the Government.

TRANSPORT.

The question of the transport of materials, and especially water, is a most serious one, and as I have already pointed out, with such a limited amount of time at our disposal, it is most essential that steps should be taken to remedy this evil. Many officers have made the suggestion, which I thoroughly endorse, that in cases where the country permits, a cart with tank and six oxen be employed by the officer, for the purpose of carrying water and materials generally. The cost of this would be more than counter-balanced by the immense saving of time and consequently money, as the work would be done in about two thirds of the time taken last season, and should prove more effectual. Taking into consideration the fact that it is contemplated including Zululand in next season's campaign, I would strongly urge that the above suggestion be adopted, as it will be quite impossible to carry out the work properly, in the wilds of Zululand, without some such aid for transport.

PUMPS.

The Deming Knapsack Spray Pump, as used by this Department during the

past season, has given great satisfaction. I would, however, suggest that before being put again in use, the footrest at the back of the pump be removed. The rest is but of little use, and after a time, owing to the strain, frequently causes the pump to spring a leak. In other respects the working of these pumps has been excellent.

ARSENIC DRUMS.

The arsenic, as used, was packed in drums, each containing 1 cwt. The arsenic itself was all that could be desired, but the drums in which it was packed were, in many cases, faulty. They appear to be composed of too light a material, and, in many cases, having passed through the tender hands of the railway officials, were found to be in a damaged condition, and certainly not safe. I gave instructions to have each drum encased in a sugar pocket before being handed to the railway, and this, in some degree, obviated the danger. I would suggest that steps be taken, before next season, to have the matter remedied.

DATE OF CAMPAIGN.

The locating and equipping of the district officers should be commenced at an earlier date this next season than last, say not later than the first week in December, and in Zululand about the first of that month. It will be necessary to appoint more district officers, as in some cases the districts were of too great an extent for one man to properly superintend, and the Department will require at least six if not eight men to carry out the work in Zululand. Their time could be profitably employed, should the hoppers not have appeared at the date of their appointment, in locating the depositing grounds. I would here pay a tribute to the district officers working with me last season. With one or two exceptions they carried out their duties in a most efficient and praiseworthy manner, and their attitude towards the public with whom they came in contact showed both tact and fairness, in spite of the fact that their duty compelled them to take such steps as may have been calculated to bring odium

upon them. I sincerely trust that this Department will be fortunate enough in securing the services of these officers in the coming season.

HORSE ALLOWANCE.

It may not seem out of place here to allude to the question of compensation, when an officer loses his horse, when on Government duty. Four officers during the past season lost their horses through sickness, and although strong recommendations were made by this department to Government, asking that some compensation be made, the wish not to create a precedent prevented the authority asked for being granted. These officers work for the Government for three months, during the worst time of the year for horse-sickness, and in some of the most affected areas, and it means, that should an officer lose his horse, he practically works for a month for no remuneration. If some system of insurance cannot be promulgated, I would suggest that officers be supplied by Government with horses, as I feel confident that unless this question of compensation be favourably settled, the majority of officers will decline to undertake the work next season, and it will be very difficult to replace them.

GENERAL.

With reference to the Acts and the Rules and Regulations bearing upon the same, there appears to be alteration needed to insure greater power, when dealing with individuals contravening the said Acts. It will be necessary to draft fresh Rules and Regulations for next season, and, amongst other alterations of a minor character, I would suggest the following:—In the case of land owned by absentee landlords, and unoccupied, and whether adjoining Crown lands, Native locations or private property, the Locust Officer should be empowered to enter upon such land and destroy young locusts thereon, where necessary, and the cost of such destruction work should be chargeable and recoverable from such absentee landlord, and in the event of such money not being paid, the amount should be

recoverable in a Court of Law. A further clause should also appear to the effect that, after notice had been given to owners and occupiers of private lands, and sufficient time had elapsed, should young locusts be still found on such lands, then the owners or occupiers should be liable under the Act, notwithstanding the fact that the young locusts may not have been hatched on their land. The minor points could be considered at a later date.

There is a feeling amongst a certain section of the community, that the expense of locust destruction should be borne entirely by the Government, whether the locusts are on Crown lands, Native locations, or private property. A certain amount of colouring is lent to this suggestion, owing to the fact that the locust is a migratory insect, frequently changing its habitat, and cannot be depended upon to remain in any one spot for any length of time, and complaints are rife that the hoppers come from one private property to another, and *vice versa*. Should the Government be called upon to take this matter in hand, and hold themselves responsible for the destruction of locusts throughout this colony and Zululand, I need hardly point out that the expense of such an undertaking would be very heavy. This is a matter which does not come within my venue, and should the public consider that the step is a right one for the Government to take, the matter rests entirely in their hands, seeing that the feeling of a country is, or should be voiced by their representatives in Parliament. The initial experiment of the season just passed, and its attendant success, despite the many drawbacks already alluded to, fully justifies the action taken.

I would urge the Government, in the future, to put no obstacle in the way of this Department continuing the work already so fairly begun, but by every means in its power to encourage and assist the undertaking, which can but prove beneficial to the community at large.

W. H. BUSHBY,

9th May, 1908. Chief Locust Officer.

Correspondence.

To the Editor Agricultural Journal.

SERUM, AND BILE.

SIR,—I shall be much obliged if you will kindly publish my rejoinder to Mr. Woollatt, P.V.S., which you will find in last Saturday's issue of the *Times of Natal*. I think it only fair that readers of your valuable journal should have an opportunity of making themselves acquainted with both sides of the controversy.

I am, etc.,

"FARMER."

14th July, 1903.

In reply to the above, some of the statements made in the beginning of the P.V.S. defence are incorrect, but these details are not material anyway. I should like to state, however, that the number of deaths at Bursua from rinderpest and inoculation is 36 and not 32, as stated by the P.V.S. The statement that Mr. Comins removed a herd of his cattle from Hlatikulu to Bursua whilst "sick animals existed at Hlatikulu" is calculated to create the impression that he removed his cattle from the sick herd, whereas he simply removed them from the adjoining farm before he was aware of the existence of rinderpest in the neighbourhood. With regard to the outbreak at Sans Souci, is it not strange that although the P.V.S. states that he has never claimed that "bile is of much practical value as a curative agent," he should lay stress upon the fact that it acted with, apparently, the very best results in this case? The P.V.S. says:—"The second herd at Bursua was not infected with glycerinated bile as stated." Now I should like to know who made that statement. It certainly did not appear in my "Notes." On the contrary, I wrote:—"As showing that the Government glycerinated bile is not all bad, I may state that another herd (by this I meant the milch cows) of Mr. Comins's was inoculated with a different lot of bile, and the results were all that could be desired. A portion of this bile was also used on a herd in the Upper Mooi River (Sans Souci), where it gave every satisfaction." Further on the P.V.S. states that all the bile used at

Sans Souci and Bursua had a "standard property, being of one lot." Mr. Comins informs me that the bile used on his milch cows—where the results were so good—was a portion of that used at Sans Souci, where the results were also excellent. The bile used on the large herd of mixed cattle—which failed so lamentably—was obtained at a different date from the District Vet., and everything points to the conclusion that it was useless stuff and not of the same standard as the other. The P.V.S. now denies that bile is of "much practical value" as a curative agent, and states that it is an "unsatisfactory agent to use alone on cattle which have been infected for any length of time." On this point I beg to differ with him. Morendaal proved that good bile possessed valuable curative properties, and also that it was very far from being an unsatisfactory agent to use alone in infected herds. I will waive this point, however, and ask the P.V.S. to be kind enough to explain why, if he knew that glycerinated bile was an unsatisfactory agent to use in cases such as Mr. Comins's, he permitted the District Veterinary Surgeon to advise Mr. Comins to inoculate with this agent, and not only advise the use of it, but actually to sell it to him? Why was Mr. Comins not advised to use serum and bile together as Mr. Moor, Messrs. Pepworth and Reid, and others had been? The P.V.S. talks about farmers studying—or failing to study—the current literature on rinderpest. Will he kindly state when he wrote "advocating" the use of serum and bile together in infected herds? Also when he issued any "current literature" informing the public that glycerinated bile was worthless except as an agent for conferring a temporary immunity upon clean cattle?

The P.V.S. seeks to throw blame upon Mr. Comins, thus following the example of the lawyer, who, when he has no case, abuses the opposing counsel. He tries to show that Mr. Comins was culpably careless in not detecting the presence of the disease at an earlier date. Mr. Comins tells me that he had a "boy" constantly with the troop, and that the allegation that they were unherded is incorrect. Further, as the period of incubation of the disease was long

passed, and no cases of sickness had been noticed, he naturally concluded that his cattle had escaped infection. This point, however, is of little importance, because we know perfectly well that science has discovered an efficient method of dealing with troops in which the infection has obtained a strong hold. The P.V.S. with his glycerinated bile—which he now states is only useful in uninfected troops—could not, of course, be expected to be able to grapple with the outbreak. All that he could possibly do would be to prevent the disease spreading to neighbouring herds, and this the owners of said herds attended to on their own account, but anyone who does not wilfully shut his eyes to the value of serum would not find that the situation presented insuperable obstacles to a satisfactory solution.

The P.V.S. states that the "period of incubation of rinderpest under ordinary circumstances is up to sixteen days." This is news to me, as it no doubt will be to many. Mr. Watkins-Pitchford, I believe, gave the period as six days. In the 1897 outbreak, when I had considerable experience of rinderpest, I invariably found that six days after a beast had been infected with rinderpest it was an exceedingly sick animal. Note, please, the words, "but the bile must have had some immunising effect in this case, as it did at Sans Souci." From this I gather that the P.V.S. acknowledges that the bile had no immunising effect on Mr. Comins's other herd. The P.V.S. states, "It should have been apparent to anyone that an agent which conferred a quick immunity was necessary in this case." The necessity for the use of an agent quicker in its action than bile evidently did not occur to the district vet. who advised Mr. Comins. Since the P.V.S. published the defence given above, I have made it my business to visit Bursaa again in order to confer with Mr. Comins, and make quite sure of my facts. On this occasion, as before, Mr. Comins assured me that the district vet. simply advised him to inoculate with glycerinated bile, which he subsequently applied. When the district vet. visited Bursaa again about nine days after the cattle had been inoculated with bile, he expressed surprise that they should still be falling sick. Then he suggested inoculating with serum and virulent blood. The district vet. did not at any time inform Mr. Comins that serum taken from cattle killed in the 1897 outbreak would be of use. He first suggested taking serum from Mr. Comins's own barely recovered beasts, next he suggested getting recently killed cattle

from Mr. J. W. Moor, and finally he suggested that some of Mr. Moor's animals that killed in the outbreak at Ennersdale, twelve months ago, should be procured. Mr. Comins does not remember whether he asked if cattle which killed in the 1897 outbreak were of any value, but he is quite positive that the district vet. did not advise him to take serum from these animals. It is evident, therefore, that the district vet. has "betrayed as great a lack of knowledge" on this point as I. This is doubly "lamentable," and I beg to draw the attention of the learned and accomplished scientist who so condescendingly occupies the position of P.V.S. to the matter.

The defence of the P.V.S. is, I consider, lamentably weak. To use a common expression, he "gives the show away" entirely. I only sought to show that some of the Government glycerinated bile was worthless. He does his best to prove that it is all worthless, although he adduces two instances—one at Sans Souci and the other at Bursaa, in the milch cows—where the bile did all that even I, who am so lamentably lacking in knowledge, expected that it would do. The fact that glycerinated bile acted so effectively in suppressing the disease in these two instances does not excite any surprise or wonder in the mind of the brilliant and world-renowned veterinarian, which remains as calmly and serenely blank as it was before he became cognisant of the circumstances attending the cases.

Ever since Mr. Woolfitt became P.V.S., the only "current literature" on rinderpest with which we have been favoured by the Veterinary Department has been an article or two in praise of glycerinated bile and in depreciation of serum. We have been led to understand from the reports of the department that glycerinated bile was the one and only method worthy of notice in dealing with rinderpest, and the fact that it is worthless, except as an immunising agent in uninfected herds, has been carefully suppressed. The light which the P.V.S. unconsciously throws upon the veterinary department methods of dealing with outbreaks of rinderpest sets one wondering what has been done for the many unfortunate owners of cattle in the northern districts in whose herds, as at Bursaa, the disease obtained a footing. The policy of the P.V.S. appears to be similar to that sometimes employed by a fire brigade, which, when it finds that a building is well alight, leaves it to burn itself out, and simply prevents the spread of the flames to adjoining buildings. This is

a policy which will not be tolerated by farmers in the lower parts of the colony, whatever they may do higher up.

The P.V.S. refers to an article of his which appeared in the "Agricultural Journal" of April 11th, 1902, and I am much obliged to him for having done so, as I find, on looking it up, some very interesting statements, a few of which I propose to include in this article, as examples of how our P.V.S. wobbles and flounders about in the few instances in which he favours us with specimens of "current literature." It seems to me, gentle reader, that the opinions of our P.V.S. greatly resemble an almanac, inasmuch as that they are only available for use in the year in which they appear. What held good in 1902 does not hold good in 1903 by any means. In 1902 he wrote:—"The bile method has become undoubtedly the most valuable and practical means for the control of rinderpest. In fact, I do not hesitate to say that it is the only "possible way" of dealing with the disease on the veld with large numbers of cattle, where it is desired to control the disease with as light a mortality as possible. Serum may be used with excellent results, however, in isolated cases, as will be shown hereafter." This year he writes:—"We have never claimed that bile is of much practical value as a curative agent. . . . It (bile) is an unsatisfactory agent to use alone on cattle which have been affected for any length of time." There is also the statement that glycerinated bile is regarded as the "sheet-anchor," etc. In 1902 the P.V.S. wrote:—"Mr. Power has also shown that the immunity conferred by glycerinated bile is established on the seventh day." This year he (the P.V.S.) writes:—"The immunity conferred by bile is established from the seventh to the twelfth day after inoculation. . . . It used to be thought that the immunity conferred by bile was established by the tenth day, but we have found from experience that it varies as stated." Will the P.V.S. kindly state when he issued any "current literature" informing the public of this important discovery, viz., that the immunity conferred by bile does not in many cases become established until the twelfth day after inoculation? In 1902 the P.V.S. wrote:—"Authenticated cases have occurred where an outbreak has been at once suppressed by the use of glycerinated bile." This year he writes of Mr. Comins's case: "It should have been apparent to anyone that an agent which conferred a quick immunity was necessary in this case." By this is meant

that some agent other than glycerinated bile should have been used. In 1902 he wrote:—"The use of serum as an immunising agent is of small practical value when compared with glycerinated bile." He further stated that "as an agent for the treatment of animals suffering from disease serum is of high value." Later he remarks:—"The use of serum on animals already showing symptoms of disease is not very encouraging." Observe the contradiction in the last two expressions of opinion. Then he continued:—"In treating animals with serum I have found that it is essential that three doses of serum be administered before the specific rise in temperature takes place, and after infection with virulent blood, if it is hoped to save a large percentage, and that infected troops are unsatisfactory to treat by this method. . . . The only hope of success is to use fresh serum from thoroughly reliable serum cattle. The use of preserved serum is not to be recommended. By this I refer to defibrinated blood, the method of preserving which is not yet forthcoming."

Next we come to the passage quoted by the P.V.S. as a proof that as far back as April, 1902, he pointed out the value of cattle that salted in the '07 outbreak for serum purposes:—"It has been undoubtedly proved that cattle that salted during the last outbreak of rinderpest are still immune, and there are many such valuable serum cattle in the country." These two exceedingly slipshod sentences, of which any primary schoolboy would be ashamed, contain all that the P.V.S. had to say on his head, and so fearful is he that even this casual mention of so important a point may be the means of distracting attention from glycerinated bile, that he immediately sets to work to recount (and to magnify) all the dangers attending the use of "serum," by which it appears later he means defibrinated blood. It is abundantly clear that it never entered the head of the P.V.S. when writing his learned and profound treatise of April, 1902, to point out that serum, either pure, or as defibrinated blood, might be employed advantageously to confer temporary immunity in an infected, or in contact, herd, so as to tide over the period of infection. He harps continuously upon the necessity for salting the animals when serum is used, and he does not forget to paint, in the liveliest colours at his command, the dangers and risks attending the process. I fail to find in this article of 1902 any mention of the advisability of using serum along with bile in troops in

which the disease has broken out. Now, the P.V.S. informs us that he has "advocated the use of serum and bile together in herds of cattle which are actually infected." Perhaps he will inform us when and how he advocated the adoption of this method, and also why he does not insist upon his districts vets recommending this method of treatment?

These, gentle reader, are a few of the "ways that are dark, and tricks that are vain" of Mr. S. B. Woollatt, M.R.C.V.S., Principal Veterinary Surgeon to the Government of Natal. You are now, I believe, in possession of all the facts material to the case, and I leave it to you to judge whether I was justified in making the comments to which exception is taken in my modest little account of the utter failure of glycerinated bile at Bursaa, and, incidentally, of the Veterinary Department.

FARMER.

The foregoing has been submitted to the Principal Veterinary Surgeon. He writes:—"It is to be regretted that 'Farmer' should have seen fit to descend to personalities in endeavouring to justify his statements. Please publish the following letter of Mr. Comins." Editor Agricultural Journal.

Dear "Farmer,"—With reference to the account given in your "Notes" of the 4th instant regarding the way in which rinderpest commenced in my herd and obtained such a hold before its presence was detected, I beg to state that the facts are not quite correctly given. It is true that my cattle had been a month away from Hlatikulu, where they had been running on my farm Marshlands, adjoining Mr. Moor's land, before the disease broke out—or, at any rate, became manifest. At the time that the calf broke out with the disease I was congratulating myself on having escaped the infection, and was not watching my cattle at all for any disease amongst them. On the 28th April my herd boy brought the sick calf mentioned by the Principal Veterinary Surgeon to my milking kraal and reported it as being sick. Whilst at the kraal it was examined by myself and a neighbour, and we were both satisfied that it was suffering from quarter-evil. All along the back and both shoulders were affected, and these parts cracked when pressed upon by the fingers. To further satisfy ourselves of the correctness of our diagnosis, we made an incision into the affected parts and from what we saw then we had not the least doubt its being affected with quarter-evil.

I may state that at this time quarter-evil was rather prevalent in the neighbourhood. As the calf was very ill we made sure that it would be dead by the following morning, but, to my surprise, it was not, and it appeared to be in just about the same state as the Jay previously. As it was still alive on the following morning (the 28th), and, apparently, but little the worse, my suspicions began to be raised, and, another neighbour happening to call just then, and going with me to inspect the beast, I decided to kill it and have a post mortem, and so set any doubts at rest. This I did, and my neighbour and I found symptoms of quarter-evil, but in the entrails we also found symptoms of rinderpest. In order to make sure about this, I at once sent for Mr. Verney, the district veterinary surgeon. This I did on the 28th of April, in the afternoon. Mr. Verney first sent the stock inspector to report, and finally came himself on the 2nd of May in the afternoon, when there were four other cattle sick. He at once declared the disease to be rinderpest. On the 4th of May we inoculated with glycerinated bile, and by this time several more cattle had fallen sick. I must not omit to state that when the sick calf was brought to the milking kraal, I, luckily, took the precaution to have it isolated. I am etc.,

WM. COMINS

Bursaa, July 6th, 1903.

"CROSS-BRED WOOL."

SIR,—In your "Passing Notes" of the 26th June, under the heading "Cross-bred Wool," I noticed a very misleading statement.

A portion of the paragraph reads: "By means of improved machinery the better cross bred wools can now be made into 60's tops, a standard that has hitherto been regarded as that of fine merino," etc.

The title 60's tops, as indeed all other numbers given to tops in the Bradford trade, is given to denote a particular degree of fineness; and it is not only untrue, but even absurd, to suggest that a coarser wool can be combed into a finer quality by improved machinery.

You may improve the "style" of the top, but you can't alter the degree of fineness.

As a matter of fact wools are sorted to the various numbers, and are known by



GOVERNMENT COLD STORAGE, MARITZBURG.

them before they go through the machines at all.

Further, improved machinery would improve the style of merino tops equally with cross-breds, and the difference in quality would remain.

Also, in your issue of July 10th, under the heading "Shropshire Merino Cross," taken from *The Empire*, there appears an unfair comparison. Referring to a sale of Cathcart (Cape Colony) Cross-breds, there is a sentence reading: "The fact that such a high price as 8½d and 7½d. was realized for combing fleece will weigh far more with a farmer whose clip is selling at 5½d.-6½d., as does the majority of Cape farmers' clips."

It is unfair to compare a *Cathcart* cross-bred with the *ordinary* merino Cape clips. Cathcart is a district growing very superior wools, in fact about the best in South Africa, and the proper comparison is with the merinos from the same district.

Against the 7½d. to 8½d. for the Cathcart cross-breds you may put 1½d.-2d. more as the figures realized for Cathcart merinos, and not 2d. less, as is suggested in the paragraph referred to.

I am not, personally, much concerned in the question "Merino" v Cross-breds. It seems a matter for the farmer to decide according to circumstances. In one case Merinos may suit best, in another Cross-breds.

But it seems inadvisable in any case that statements should be made that will not bear investigation.

It would be well if thorough trials could be made to get at the bottom of the matter.—Yours, etc.,

EXPORTER.

[In thanking Exporter for his letter we beg to say the Passing Note referred to was based on information derived from a letter of a Bradford wool expert.—Ed. *Agricultural Journal*.]

Cotton Growing.

SEVERAL enquiries for information with regard to cotton growing have been recently received by the Department. In reply to one of the enquirers the Director of Agriculture wrote:—

"Sir,—Two attempts were formerly made to establish the industry here, but both failed.

"The first attempt was made in 1845, by the formation of a 'Natal Cotton Co.,' which acquired rights over 25,000 acres in the Victoria County on the coast, and commenced the cultivation of cotton, but abandoned it owing, it is said, to the fact that the crop became spoilt by the wet owing to the harvest time falling during the rainy season.

"The second attempt was made in 1864, attention having been again turned to the subject owing to the high prices of cotton consequent on the American Civil War. The scheme was planned by Dr. Mann, then superintendent of educa-

tion. A number of people settled for the purpose in the Umkomanzi Valley, on the road to Springvale. Many well-known names were among these settlers, including those of Cecil and Herbert Rhodes, Leslie, Ballantyne, and the Gordons. These settlers continued to grow cotton, it is said, up to 1869, when, according to one informant, the industry was abandoned for the same reason as in the first attempt, namely, the unsuitability of the seasons at harvest time. According to another informant, however, the reason for its abandonment was the uncertainty of Kafir labour and the fall of prices after the close of the war. The cotton grew well, and wild cotton plants which have descended from those introduced for cultivation are to be found in widely scattered districts along the coast of Natal and Zululand.

"It is probable that attention will again be given to the industry in Natal."

Central Experiment Farm.

REPORTS OF FIELD EXPERIMENTS.

By the DIRECTOR OF AGRICULTURE.

CULTIVATION OF SWEDES.

THE accompanying picture represents one set of a series of experiment plots known as the "cultivation plots," the object of which was to ascertain the comparative effects of subsoiling, surface cultivating, and manuring on the soils experimented upon. The crop grown on the set shown in the picture was swedes. The results from a similar set of plots on which potatoes were grown were published in the last issue of this *Journal*.

It is not often such extraordinary contrasts are to be seen as those shown by the accompanying picture to have existed be-

tween the different plots in this set of experiments. All the plots were sown with the same kind and quantity of seed on the same day, and the seed germinated on all the plots; but, while the plants grew all right on some, on others they never succeeded in growing more than one inch or so in height, many of them, indeed, dwindling away and leaving the ground bare.

The following table gives the actual weights of the crops harvested from this set of plots:—

CULTIVATION EXPERIMENTS, CENTRAL EXPERIMENT FARM, 1902-3.

SWEDES, ON HILL SOIL (RED LOAM).

Variety—"Purple Top." Sown 24th February. Harvested 11th July, 1903.

No. of Plot.	Nature of Treatment.	Field per Acre.								
		Roots.			Tops.			Total.		
		Tons.	Cwts.	Lbs.	Tons.	Cwts.	Lbs.	Tons.	Cwts.	Lbs.
1	S. — —		Nil			Nil			Nil	
2	S. C. —		Nil			Nil			Nil	
3	S. — M.	5	18	4	1	12	76	7	10	80
4	S. C. M.	6	0	0	1	11	90	7	11	90
5	— — —		Nil			Nil			Nil	
6	— — M.	6	8	103	2	2	27	8	11	18
7	— C. M.	6	3	4	1	18	85	8	1	89
8	— C. —		Nil			Nil			Nil	

EXPLANATIONS.—

S. Means subsoiled with subsoil plough, which stirred the subsoil without bringing it to the surface

C. Means cultivated with horse hoe while the crop was growing.

M. Means manured with $\left\{ \begin{array}{l} 150 \text{ lbs. Nitrate of Soda} \\ 300 \text{ lbs. Superphosphate} \\ 150 \text{ lbs. Potash Chloride} \end{array} \right\}$ Per Acre.

The above results bring out practically the same facts as those shown by the potato cultivation plots, the returns of which were published in last issue. In no case were the crops good, the season having been unfavourable. Without manure there were no crops at all. There were better crops without subsoiling than with, the average of Plots 6 and 7, with-

out subsoiling, being 8 tons 6 cwt. 53 lbs. per acre, while the average of Plots 3 and 4, with subsoiling, was 7 tons 11 cwt. 29 lbs. On the whole, there were slightly better crops without surface cultivation than with, the average of Plots 3 and 6, without cultivation, being 8 tons 105 lbs. per acre, while the average of Plots 4 and 7, with cultivation, was 7 tons 16 cwt.

90 lbs. The effect of cultivation, however, was in each case to increase the proportion of roots and decrease the proportion of tops and leaves.

EXPERIMENTS ON DISTANCE OF PLANTING MAIZE.

Four series of experiments—two on the hill and two in the flat—were conducted during the season for the purpose of ascertaining the most suitable distances for sowing maize. In each series there was, first, a set of four plots, having eight rows in each, the rows being $2\frac{1}{2}$ feet apart. In the first of these plots the plants were 1 foot apart in the row; in

the second, the plants were $1\frac{1}{2}$ feet apart in the row; in the third, 2 feet apart; and in the fourth, $2\frac{1}{2}$ feet apart. Then came a set of five plots of eight rows each, the rows being 3 feet apart, the plants beginning at 1 foot apart in the row, and going up by successive stages until in the last plot they were 3 feet apart in the row. Next came a similar set, having the rows 4 feet apart. Lastly, there was a set of seven plots, having six rows in each plot, the rows being 5 feet apart. The results from the flat are not yet available; but these from the hill are given in the following table:—

EXPERIMENTS ON DISTANCE OF PLANTING MAIZE, 1902-3.

HILL SOIL (RED LOAM).

Sown - 11th to 19th November, 1902.

Harvested - 13th to 22nd May, 1903.

Distance of Plants in the Rows:—		1 ft.	$1\frac{1}{2}$ ft.	2 ft.	$2\frac{1}{2}$ ft.	3 ft.	$3\frac{1}{2}$ ft.	4 ft.
Distance of Rows.	Variety of Maize.	Yield of Grain, in Muids, per acre.						
$2\frac{1}{2}$ ft. ...	Hickory King 8-row Yellow	5'10 3'10	5'37 3'45	6'10 3'72	6'42 4'15			
	Mean ..	4'10	4'41	4'91	5'28			
3 ft. ...	Hickory King 8-row Yellow	5'94 3'75	5'96 3'94	6'25 4'08	6'00 3'66	6'00 3'46		
	Mean ..	4'84	4'95	5'16	4'83	4'73		
4 ft. ...	Hickory King 8-row Yellow	5'53 2'98	5'73 3'61	5'58 3'69	5'39 3'47	5'20 3'44		4'38 3'48
	Mean ..	4'25	4'67	4'63	4'43	4'32		3'93
5 ft. ...	Hickory King 8-row Yellow	5'98 3'78	5'63 3'60	4'35 3'33	4'57 3'18	4'38 3'07	3'48 2'48	3'03 2'32
	Mean ...	4'88	4'61	3'84	3'87	3'72	2'98	2'67

The heaviest yields are shown in the above table by the thick vertical lines. It will be seen that in each set the heaviest yield was obtained with, approximately, 6 square feet to the plant. Thus, in the $2\frac{1}{2}$ -feet rows the heaviest yield was where the plants were $2\frac{1}{2}$ feet apart in the row; there being thus $6\frac{1}{4}$ square feet to each plant. In the 3-feet rows the heaviest yield was with the plants 2 feet

apart in the row, thus giving 6 square feet to the plant. In the 4-feet rows the heaviest yield was with the plants $1\frac{1}{2}$ feet in the row; and in the 5-feet rows the heaviest yield was with the plants 1 foot apart in the row.

The best result as concerns weight of grain was obtained with the plants $2\frac{1}{2}$ feet each way, but somewhat finer cobs were obtained from the plants grown

3 feet by 2 feet ; and, generally speaking, the cobs were smallest with the closest planting and largest with the widest planting. The difference, however, in the cobs where 6 square feet was given to

each plant was in no case a very noticeable one. The proportion of grain to stalk was greater in the 4 feet rows than in the 3 feet and 2½ feet. This is shown by the following figures :—

		Grain per acre.	Stalks, etc., per acre
2½ ft. rows ; plants. 2½ ft. in row ; 6½ sq. ft. to plant	...	1,056 lbs.	1,227 lbs.
3 ft. rows ; plants. 2 ft. in row ; 6 sq. ft. to plant	...	1,032 lbs.	1,037 lbs.
4 ft. rows ; plants. 1½ ft. in row ; 6 sq. ft. to plant	...	934 lbs.	869 lbs.

Probably, with a more favourable season and richer soil, wider planting would have given better comparative re-

sults. The results next season may be different.

Judging at Shows.

To the Editor Agricultural Journal.

DEAR SIR,—I am very pleased to know that you are giving some attention to the matter of "Judging at Agricultural Shows," and I trust that we will have opinions expressed on this subject from some of the many men who have acted in the capacity of Judges at the various shows, and, to the best of their ability, have always "done their level best."

Judging at shows, under the most favourable conditions, is a thankless and onerous duty, and it is a matter of utter impossibility to please exhibitors, generally speaking, as each one, as a rule, considers his geese to be swans, and if the unlucky Judge happens to differ with him, he is, as a rule, dubbed by Mr. Exhibitor and his immediate friends as a rank duffer. Before we too closely criticise our Judges, we must remember that these gentlemen are deserving of the thanks of all classes of the public who are interested in shows ; generally speaking, they receive no remuneration, and they perform their duties at much inconvenience and pecuniary loss to themselves, and it is to such public spirited men, in a great measure, we owe the success of our shows.

Personally, I am convinced that much can be done to improve upon the present system whereby our judging is arranged. There is, with regard to the appointment of Judges, one rule which should be strictly observed, and that is "that no person should act as a Judge at a show in the district of which he is a resident."

Much ill feeling would be avoided by the adoption of such a measure. Take your Judges from a district as remote as possible.

With reference to the subject of "Open Judging," I take it that the meaning of this expression is that judging is done by a scale of points, and that the Judge is expected to hand in a form which shows the points allotted, and how he has arrived at his final decision. This, I believe, is the system universally adopted by agricultural societies in Great Britain and the more progressive of the colonies, but we are not yet strong enough financially to adopt such a method, as we cannot afford to pay Judges, which, I understand, is the custom at home. There should be an instruction given to Judges to the effect "that, if any exhibitor should wish to be informed as to any faults of his exhibit, the Judge should be ready to furnish such information." The exhibitor should not be allowed to presume on such a privilege, and after the Judge has given his reasons for any decision, the matter should be at an end.

One of the most difficult matters which an agricultural society has to deal with is the procuring of proper Judges for various classes, and the manner in which such appointments are made is at times ridiculous. Judges are appointed by the Society's committee in the following manner :—A member of the committee nominates an individual (with whom he is personally impressed), and often the

other committee men are not in a position to question the nominee's ability, but take it for granted, and the appointment is made without further question. In such a manner, I have known a worthy friend of mine appointed to act as Judge of intricate machinery, about which he knew practically nothing. Sometimes a member will nominate as a Judge a person whose chief claim to such a position is that he happens to be a leading man or laird of a district, the position probably being held by purse measurement. The laird must not be overlooked, and so he becomes a Judge, probably of windmills or elephants; and to his credit it may be said that he accepts the position, and would be ready to do so if he had to judge rattlesnakes. Now, Sir, this is very wrong, and we must make up our minds to fix things better.

I think that some move should be made by the Agricultural Societies to establish an "Association of Judges of Stock and Produce," and that, before any individual should be allowed to become a member of such association, he should be approved by a committee (consisting of a delegate from each agricultural society in the colony) as a fit and proper person, capable of performing the duties of a Judge in whatever class he may prove to have a knowledge of. If such a measure could be adopted, we could then have a list of Judges from whom we could select, and thus avoid appointing local men; and the least we could do in return for the services of such men would be to pay all expenses of attending shows, and a nominal fee as well. Later, we could try and come into line with the Home societies in our system, and institute out-and-out open judging, which, I feel assured, would meet with general approval at the hands of all interested in agricultural shows.—I am, Sir,

Yours faithfully,

D. C. DICK,
Judge, Maritzburg Agricultural
Show, 1903.

Maritzburg, July 15th, 1903.

SIR,—The question of judging at Shows is no doubt one of first importance, and the supply of expert Judges by either the Government or by the Agricultural

Societies is well worthy of attention. The selection of Judges is always a difficult matter for the Committee, and often of a disappointing character, as in many cases they are unable to attend, and not unfrequently fail to "turn up." Result, an "emergency man" has to be found at the last minute. On the general question I am of opinion that anyone accepting the position of a Judge should be able to give his reasons for any decision he may arrive at, and should have general knowledge of the leading principles which govern the merits of the Class on which he is Judge. While the new method would relieve the Agricultural Society of the responsibility of electing Judges, it by no means follows that the man who thinks his particular exhibit second to none will be satisfied, and it must also be remembered that even in the case of experts "Doctors differ."

The method of judging by *points* is advocated by many, and, no doubt, has its advantages. Two Judges may arrive at the same decision on the same subjects only by different means; and where exhibits run each other very closely in merit, may come back to decide by general appearances. I have known a sack of oats lose the first prize by being put in new sack, the grain looking dark by contrast, though on close examination it was decidedly superior.

With live stock the difficulty is greatest, and often some of the best animals would lose their proper position as to merit when "Show conditions" or "get up" have to be taken into consideration by points: for instance, a bull may have been running at stud up to within a few weeks of a Show, and presents a generally rough and unkempt appearance, but otherwise of generally better quality than the fully groomed and perhaps coddled animal that carries off the premium. A popular win with the public, no doubt, but on the abstract question of real merit, a mistake.

Speaking generally, I am in favour of giving the new scheme a trial. It might be difficult, and perhaps expensive, but if Shows are arranged to follow each other at convenient intervals, it might be done in conjunction with the adjoining South African Colonies. The Judge whose report you quote mentions "his listeners day after day." If each beast is

to be the subject of a technical lecture, I am afraid our shows will occupy a good many more days than they do at present; nevertheless, give it a trial if possible.

JAMES KING.

Judge, Maritzburg Agricultural
Show, 1903.

Lynedoch, Nottingham Road.

DEAR SIR,—My opinion on class judging is this:—I do not think it can be beaten, but where can Natal find the men to do it? In any judging a man wants to be very careful, but when you come to class judging, you want men who understand points, and the few men here at our shows who understand the points are the men who show, and, of course, they would be debarred from judging. I should very much like to see class judging come into our shows, but seeing how well and satisfactory the judging is done so far, I think we had better leave class judging alone a little longer.

Yours faithfully,

J. MOON,

Judge, Maritzburg Agricultural
Show, 1903.

Manderston, July 15th.

DEAR SIR,—You have referred the matter of Judges giving their reasons for their awards to me for my opinion. Theoretically, it is all right, and where you can get professional Judges; but where we have trouble enough in getting men to judge, I fear you would not get men to do the work. It is quite trouble enough to do the judging, without arguing with every dissatisfied exhibitor.

Then we have to remember the excellent advice once given by one of our astute Judges: "It is when you begin to give your reasons for your decision that you come to grief."

Yours faithfully,

THOS. K. MURRAY,

President, Pietermaritzburg
Agricultural Society.

Cleland, July 13th, 1903.

DEAR SIR,—With reference to judging at Shows, nothing would please me better than giving reasons for my judgment. I believe in single Judges; but the classification at our shows is too mixed to enable a Judge to enter into the close reasoning that would make his judgment of any great educational value. You must be aware that the points of an animal are not understood by the general public, and it is only by faith in Judges, as being trustworthy and qualified men, that they can be satisfied. What I should propose is, that a special steward should make notes of the Judges remarks at the time, and that these notes should be handed the Judge to explain and enlarge upon at his leisure. If a class should be so mixed that a Judge could not compare points, it would be hardly fair to ask him to define too closely his reasons, for instance, especially in "special" prizes—Cart Horses, Hackneys, Cleveland Bays, and Thoroughbreds, in one class—it is hopeless for a Judge to satisfy himself, let alone other people. At the Maritzburg Show this year, there were as fine a lot of Cleveland Bays as have ever been shown here; but no notice was taken of them, as they were shown against other breeds, which breeds the Judges, having to say one way or the other, thought, I presume, were more what were required here. Again, some horses were brought on in the pink of condition and others quite the reverse. A good Judge would know that if the conditions were reversed, the low-conditioned horses would be by far the best. What is he to do? He has no accepted scale of points, allowing so many points for get up, etc., so he has to give the most unlikely looking horse the prize.

Yours truly,

W. T. WOODS,

Judge, Maritzburg Agricultural
Shirley, Mooi River, Show, 1903.
July 17th, 1903.

DEAR SIR,—I have read the article on "Judging at Shows," and agree with most of its contents.

I have always made it a rule to invite questions from any exhibitor who seeks to know why his exhibit failed in my judgment. I have always objected

to act in conjunction with other Judges, because I consider a Judge should be able to give reasons for his decisions if called upon to do so.

But I would take this opportunity to point out that for shows to be educational, more classification is necessary. A "general purpose horse," I think, is a mistake. He is fit to serve no purpose so well as one specially bred, and to ask a Judge to pronounce which is the best horse out of the twelve, when ten of them are of quite different breeds, and all claim to be "general purpose" horses, is a little conflicting. And, again, to give a prize to the best animal (irrespective of his class, ranging from the heavy Clydesdale to the blood pony, to the best of the lot, providing it has been fed on certain food, is simply playing into the hands of an advertiser, and frustrates the object for which shows should be held.

With regard to judging by points *versus* judging by comparison, the former has its disadvantage, in that it takes more time, and an animal with exceedingly good points in one part and exceedingly bad ones in others (which throws the animal out of balance and renders him useless for the purpose for which he is bred) may score as many points as another which may be fairly good all round, although, perhaps, in no part scoring top points.

Again, Judges should have more definite instructions. At the recent Maritzburg Show, a valuable prize was given to be decided by points (so I saw afterwards in the catalogue); but no such instructions were in the catalogues issued to Judges. I think, in future, all animals should be judged in their own class.

There is no such thing as the best horse or bull in the yard. There may be the most valuable one from a monetary point of view, but even he may be a bad animal of his class.

The time in which to do their work should be proportioned to the amount of work the Judges have to do. At the recent Maritzburg Show, I endeavoured to pass judgment on 201 horses in 180 minutes. Judging commenced at 10 a.m., and the Show opened at 1 p.m. Where many horses are entered for hack prizes, each exhibitor should individually claim the attention of the Judge to his exhibit

when put through all paces. When there are 22 in one class, it is impossible to do justice in the time.

I would suggest that the Judges should go further than awarding the prizes, and make remarks on each animal exhibited, stating where his faults or deficiencies lie which prevent his taking a prize. These remarks should be taken down by a reporter accompanying the Judge, typed off in slips, and attached to the stall of each animal on the second day, so that the opinion of the Judge may be open to the criticism of the public.

And where an animal is considered by the Judge to be unsound, it should be his special duty to point out such unsoundness.

In awarding prizes for jumping and driving competitions, each Judge should declare audibly, through a speaking trumpet to the public, how many points he places to the credit of the competitor at each jump and pass-way. This will not only give the public more interest, but it will also prevent any miscarriage of justice.

In all hack or hunter competitions, sub-division should be made as for horses in the opinion of the Judge, capable of carrying up to eighteen stone, and others, say, up to thirteen stone. A horse capable of carrying eighteen stone in a fast run as efficiently as one only capable of thirteen stone is really worth more than double the money. Yet the thirteen stone horse, may, in his class, be all that could be desired.

In conclusion, I think Judges, as a rule, do not get all the consideration they deserve. A pig which goes to the show is carried to and fro gratis, but the Judge has to pay his fare both ways. I think the Agricultural Societies should see that the Judges are not compelled to pass the night on a billiard table, after travelling a long way to officiate at a Show.

Yours truly,

THEODORE WOODS,
Judge, Maritzburg Agricultural
Show, 1903.

Maritzburg, July 16th, 1903.

July 17th, 1903.

DEAR SIR,—With reference to the article *re* judging at our Shows, I think the Judges should be, if possible, selected from neighbouring districts—the less they know of the people and animals being judged the better. I would in cases where the Prize is paid for the first Bull or Cow, etc., state “if worthy,” as I have seen many animals receive the First Prize and Special Prize that were not fit to enter a Show Yard. For this reason it would be well for the Judge to give his opinion of the animal in each case where the Prize is awarded or where the animal is considered unfit for a First or other prize. His remarks in this way might be of interest to the owner and the general public. It should not be difficult to arrange the engagement of reporters or a

shorthand writer to take down such notes, and it might simplify matters if a list of questions were printed for this purpose.

I would recommend that in each case the Judge be offered his train and post cart fare, in addition to £1 per day for the number of days necessary to travel to and from the Show, thus making a business matter of the judging. In most cases it would not be accepted, or would be refunded to the Society, whereas in other cases a useful man might not be in the position to afford the time and expense on his own account.

Yours faithfully,

G. M. YOUNG,
Judge, Maritzburg Agricultural
Show, 1903.

How Sugar-Canes are Raised From Seed.

THE following interesting account of the method adopted at Barbados for raising new sugar-canes from seed has been contributed by Mr. J. R. Bovell, F.L.S.F.C.L., Superintendent of the Sugar-cane Experiments connected with the Imperial Department of Agriculture. Mr. Bovell occupies a unique position in this matter as he was one of the first to take up the work and has been continuously engaged in it since 1899:—

“In Barbados the panicles (arrows) are gathered as soon as the spikelets begin to be blown away by the wind, or as soon as a slight shake of the stem of the cane causes a few to fall. The panicles are then put into thin muslin bags and hung in a dry, airy place where a certain amount of sunshine is obtainable. At the end of a few days, when all the spikelets are readily detached, these are rubbed off and returned to the bags to dry for a couple of days longer. The seeds are then sown in well drained boxes of sifted garden soil, covered lightly with fine soil, watered, finally covered with sheets of glass and put under cover, where they can receive only a limited amount of direct sunshine. Usually at the end of the fifth day a few of the plantlets will be up. At the end of the second week,

nearly all those likely to germinate will have grown. The seedlings are then somewhat hardened by gradual exposure to fuller sunshine. By the end of the second month they are fit for transplanting, they are then pricked off into small pots and placed under racks on which sacking is put during the hotter time of the day to protect them from the full blaze of the sun. By degrees this time is shortened until they no longer need any shade. Three months from the time the seed is sown the plants are ready and ought to be taken to the fields. But in Barbados, owing to the dry weather at this time of the year, it is necessary to let them remain in the pots until the rainy season sets in. The seedlings are now allowed to go on growing until the following December when the most vigorous and largest clumps are regrown from cuttings in comparison with one of the standard canes. In the December of the second year of their growth the canes undergo a second selection, based on their vegetative characters, a portion of the plot being kept for chemical analysis in the following reaping season. From now onwards the selection is based on the weight of the stems and the saccharine richness of each cane.”

The Real Siberia.

WHAT Siberia is like is depicted by Mr.

John Foster Fraser, who undertook a journey of six thousand miles across the country, and he has given his experiences in a most interesting account of the trip, entitled "The Real Siberia," which was published in the "Pall Mall Magazine" some months back. The immediate cause of the awakening of this great country has been the building of a railway line across it for military purposes by the Russian Government. Going through the country, Mr. Fraser expected to find snow, and ice, and convicts, and prisons, and wolves at every turn, and he ended by being amazed at the colossal agricultural possibilities. "In the west," he says, "you can travel through two thousand miles of the finest wheat-raising soil in the world. You see herds of horses, not large, but sturdy and serviceable. Now and then there are flocks of sheep. Often there are great unbarriered pastures, with cows grazing. They don't strike you as the finest kind; but the butter—well, let me explain what happened at Ormsk, the first big city eastwards beyond the Urals:—

"Four years ago a Dane travelled that way. He tasted the local butter, and found it excellent, and being a business man a business idea entered his head. There is a considerable demand for 'best Danish' butter in England. So that summer he shipped 4,000 buckets of butter to England, and those of us who ate it did so believing it to be really 'best Danish.' The scheme got abroad. There was positively a stampede of Danish butter firms to Ormsk. I found last year's representatives scouring the country for four hundred miles round, buying butter from the peasants. The railway authorities were delighted, and built special refrigerator carriages. Last summer Ormsk sent 30,000 buckets of 'best Danish' every week to England, and the week I was there five great trains, carrying nothing but butter, left for Riga, the port. Fourteen firms are busy with this new butter trade. Thirteen belong to the Danes, and one belongs to a Jew.

"There was not a single Russian in the business, and that fact explains much. It is the key, indeed, explaining the cause of Siberian slumber for generations. Siberia has everything to give the world in the way of agriculture, but the Siberians are the most wretched agriculturists I have ever come across. It was not till the foreigner came along and began talking that the Russian Government realised that Siberia could be used in any other way than as a place of exile, and that over the trans-Siberian line something besides soldiers could be conveyed. The result is, so great has grown the traffic, that the line which was hurriedly thrown down for military purposes is unable to bear the strain, and, therefore, at the expenditure of many millions of pounds, the way is being re-ballasted, and much stronger metals laid down. Indeed, just now the Russian powers that be are in a fluster of desire to wipe out all that is evil in the record of Siberia, and make the country blossom with happy homesteads. Glowing inducements are held out to the Mondjiks of the barren southern steppes to emigrate into Siberia; free passages are provided, and each spring 300,000 poor are taken to Chelyabinsk, the first town beyond the Urals, where there are large buildings for their accommodation until they can be sorted into groups and sent off into the wilderness to start life afresh. Big plots of land are given the newcomers; instructors are constantly travelling, showing how best the land can be cultivated. The Government purchase American farming machinery, and let the peasantry have it at cost price, payable on the instalment plan."

Yet, with all this, Mr. Fraser finds that Siberia is little more than a neglected prairie, and he asserts "that the Russian has not got it in him to be a successful farmer. He has not the faculty for understanding the nature of soils; manuring is beyond his comprehension; indeed, he would rather not eat food raised on manured land. You never see ranches as in America. The Russian is

fraternal, and he will not live on a farm 10 or 15 miles from a neighbour. He must herd in villages, even though he is obliged to go 10 miles to his land. He seizes all opportunities to avoid work. He cannot work to-morrow because it is a saint's day—there are about 150 saints' days in the Russian calender—it is no use doing any-

thing on Saturday because the next day is Sunday, and he is too good a Christian ever to labour on the Sabbath. Monday, well, no Russian ever started to do anything on a Monday. On Tuesday the weather is bad, and on Wednesday there is something else wrong. So his corn, that he may have cut, lies and rots."

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of June, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised. tons. cwt.	
	Above Ground.			Below Ground.							
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Natal Navigation	20	77	133	18	282	81	6	9	2	11,128	0
Dundee Coal...	13	1	172	13	144	343	4	28	27	10,686	10
Elands Laagte	10	20	173	11	170	260	...	...	...	9,762	17
St. George's ...	11	81	94	8	191	87	1	9	...	7,746	0
Glencoe	15	132	17	9	301	10	3	6	...	5,385	4
Natal Steam Coal	...	...	...	4	180	20	1	6	1	2,799	6
Natal Marine	6	47	7	5	87	4	...	...	...	1,890	18
Newcastle	3	10	11	3	93	3	...	...	...	1,830	2
Ramsay	3	12	14	2	34	26	2	16	12	1,717	14
W. Lennoxton	2	9	11	2	23	31	...	2	3	1,600	0
Central	2	33	2	2	69	...	2	4	1	1,168	14
Natal Merthyr	3	40	3	2	110	4	1	10	...	963	2
No. 42	4	12	14	2	48	2	...	...	...	770	8
Crown	2	12	32	2	42	4	...	...	...	751	0
South African	6	48	6	4	70	1	6	125	...	534	0
Natal Victoria Navigation	1	24	2	1	47	...	2	8	1	268	16
New Campbell	2	4	10	1	9	6	...	...	...	253	0
Hlabane	...	1	...	1	8	...	...	1	...	123	18
Vrede	1	5	...	...	...	...	...	...	...	33	0
Total	104	568	701	90	1,908	882	28	224	47	59,412	9
Corresponding month, '02	111	458	655	81	1,427	1,285	15	52	89	49,187	15

9th July, 1903.

CHAS. J. GRAY,
Commissioner of Mines

Return of Coal bunkered and exported at the Port of Durban for the month of June, 1903 :—

	tons.	cwt.
Bunker Coal	...	...
Exported to :—	23,807	6
Cape Colony	95	17
Delagoa Bay	78	10
Total	23,981	13

Custom House, Port Natal,
1903.

(Signed) W. L. HOWE,
for Collector of Customs.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	N. Grant ...	Branfontein
		"	J. Ralfe ...	Frere
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	F. B. Moor ...	Greystones
		"	J. G. Hatting ...	Rama
		"	A. C. Harding ...	Meadow Bank
		"	H. J. Hatting ...	Kopliegte
J. Button ...	Estcourt, South of Bushman's River	"	Unknown ..	Mooi River Pound
		"	J. E. Oates ...	Eversdale
		"	J. Piccione ...	Greenfields
		"	J. Lawrence ...	Grantley
J. J. Hodson ...	Lion's River ...	"	W. Henderson ...	Hilton
E. J. B. Hosking ...	Upper Umkomanzi	"	J. Baynes ..	Meyer's Hoek
		"	J. A. Vanderplank	Nimbankulu
K. Soutar ...	Portion of Lion's River	"	C. J. Smythe ...	Stratherne
		"	J. Chadwick ...	Howard
J. Swales ...	Manda and Indwedwe	"	K. Soutar ...	Stey Braes
		"	Pumputa & Charlie	Indwedwe
		Lungsickness	Nkangala ...	Mount Sergeant
W. Wilson ...	Polela ...	Scab	J. D. Watson ...	Rainbow
		"	H. Nicholson ...	X.L. Farm
		"	H. Brown ...	Prosperity
		"	J. Stone ...	Gowrie
		"	J. Comrie ...	Hepburn
L. Trenor ...	Alfred ...	"	W. Niemack ...	Macton
		"	Yolwayo & Nvuna	Location
A. H. Ball ...	Weenen ...	"	A. D. J. Taylor ...	Beaconsfield
		Lungsickness	Seddon & Harris	Weenen Common-
				age
E. Varty ...	Umvoti, Western Portion	Scab	J. G. Nel ...	Elladale
R. J. Raw ...	Impendhle ...	"	C. P. Speirs ...	Mount Park
		"	Albert Meliffe ...	The Forks
B. Vause ...	Ixopo ...	"	A. Watson ...	Forest Hill
C. Swales ...	Umlazi ...	Lungsickness	Cold Storage and Supply Co.	Richmond Farm, near Pinetown
		"	Native, Sam Fawkes	Assegai Kraal, near Botha's Hill
		"	John, & Mr. Kirk	Umlazi Location
A. Hair ...	P.M.Burg City and Umgeni	Scab	E. Taylor and Um-	Zwartkop Location
			babana	
A. J. Marshall ...	Dundee ...	"	Sai M'Lief ...	Banff
		"	N. Glutz ...	Swiss Valley
		"	H. Thorn ...	New Port
		"	Willie Africa ...	Waschbank
C. E. Walker ...	Umsinga ...	"	P. R. N. Vermaak	Balgownie
		"	Hlabelela ...	Location
		Lungsickness	Umtagati ...	Mhlesunga
		"	Mbitgi ...	Craigneathen
		"	J. S. Vander-	Pomeroy T. Lands
			westhuysen ...	
		"	Mahakana ...	Jobsdale
J. Chaplin ...	Klip River ...	"	James ...	Kleinfontein

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
J. Chaplin ..	Klip River ...	Lungsickness	Malandala ...	Matowan's Kop
		"	Umbali ...	Kleifontein
		"	Matobula ...	"
		"	Thorold & Co. ...	End'vogle Vlei
		"	Goozla and 2 other	Opmersanhein
		Scab	W. Wright ...	Colworth
		"	J. A. de Waal ...	Blauwbsnk
		"	P. B. de Villiers ..	Good Hope
		"	H. Potgieter ...	Beauvale
		"	M. H. Wessels ...	Doornkloof
		"	A. G. Boers ...	Marias Hevel
		"	C. Coventry ...	Groote Hoek
		"	R. Horaley ...	Warwick
		"	M. J. Wessels ...	Morden
		"	S. Schoeman ...	Maritz Drift
		"	O. M. Wessels ...	Welkom
		"	P. Nicholson ...	Hobaland
		"	W. Leathern ...	Glydesdale
		"	Mabat'hi ...	Georgina
		"	H. W. Boers ...	Alexandra
		"	B. Johnstone ...	Dosslefontein
R. Wingfield Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
G. Daniell ...	Vryheid ...	"	B. E. A. Rabe ...	Emjati
		"	Nkwata ...	"
		"	H. Steencamp ...	Bloemhoff
		"	G. Vanderwest-huysen	Vaalko; jes
		"	Chas. Mossop ...	Cliffdale
		"	W. Hankey ...	Bergendal
		"	Umahigashi ...	Welgevonden
		"	Umfumwa & Dehla	Waterval
		"	F. Combrink ...	Bankroet
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Kwapela & Silemela	Welverdiend
		"	Umsauw ...	Langverwacht
		"	Mazwana ...	Riversdale
		"	L. Meyer & Hlovu	Eensjevonden
		"	J. J. Gove ...	Uitzicht
		"	H. Davel ...	"
		"	Solyelana ...	Leunnek
C. T. Vaughan ...	Paulpietersburg ...	"	Stumpf ...	P. P. Burg T. Lands
		"	Natives ...	Jachtbaan
		Scab	— Heine ...	Bedrog

The Province of Zululand is an infected area under the Lungaickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 10 herds of cattle under license for Lungsickness, and 7 flocks of sheep under license for Scab as under:—

Zululand—Ehhowe, Umlalazi, Lower Umfolosi, and Entonjaneni

Districts ...	...	2 for Lungsickness	3 for Scab.
" Nkandhla and Ngutu Districts...	...	—	4 "
" North of White Umfolosi and Umfolosi Rivers	...	8	— "
Total ...	...	10	32

Rinderpest exists at undermentioned places:—

Estcourt Division.—Sans Souci.

Zululand.—Ehhowe, Umlalazi, Mahlabatini, Lower Umfolosi, Nkandhla, and Ndwandwe Districts, Vryheid District, Paulpietersburg District.

Principal Veterinary Surgeon's Office, 23rd July, 1903.

M. J. HIME, for P. V. Surgeon.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of June, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from same period July 1st, 1902.	Total for same period from June 1st, 1901.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	74.9	52.7	80.4	46.1	70	5	48	21st	34.60	48.65
Stanger... ..	78.0	50.3	84	43	59	5	35	21st	34.82	35.62
Verulam	75.7	49.5	85	42	57	5	33	21st	32.72	41.02
Newcastle	63.2	34.2	61	30	57	1	57	...	22.54	33.14
Ndwedwe	71.3	49.6	84	40	61	4	29	5th	...	...
Estcourt	70.4	32.4	76	26	...	...	...	...	25.25	30.71
Port Shepstone ...	80.0	47.9	83	41	...	...	...	...	...	...
Umsinto	77.4	48.4	85	42	18	3	13	4th	38.72	38.07
Richmond	70.7	40.4	82	33	105	4	50	4th	32.19	41.21
Maritzburg	73.7	40.3	85	30	21	2	12	4th	23.33	32.28
Howick... ..	65.7	32.7	80	27	28	4	14	5th	19.48	30.53
Weenen	72.5	28.9	81	23	00	1	00	21st	24.28	28.68
New Hanover	69.6	37.9	82	29	16	4	52	21st	27.20	37.95
N'Kandha	67.2	38.6	71	32	05	1	05	2nd	...	...
Qudeni	59.7	36.1	70	27	97	7	69	22nd	44.10	59.39
Melmoth	70.4	47.6	83	40	12	3	09	23rd	26.08	31.16
Eshowe... ..	70.7	50.0	81	42	43	2	28	23rd	39.68	...
Point ... ..	...	...	...	...	74	3	44	21st	...	32.49
Mahlabatini	68.1	51.1	79	43	...	...	...	...	...	...
Lower Tugela... ..	81.2	45.4	89	38	52	5	20	23rd	28.61	...
Nqutu	63.6	24.8	87	14	...	...	...	...	22.27	...

Gleanings.

According to R. W. Clark, Assistant Agriculturist at the Alabama Experiment Station, U.S.A., the most satisfactory method for factory managers of preserving the composite milk samples for testing, consists in the addition of half a teaspoonful of formalin to each pint of milk. This gives a one-half per cent. mixture, which will remain in good condition for testing for one month in any season. Potassium bichromate and Mercuric chloride were tried, but gave unsatisfactory results.

Major-General Sir Edward Hutton, since his assumption of the command of the military forces in Australasia, has drawn up a complete code of instructions for the organisation and training of mounted troops, which he has ordered to be strictly observed by all under his command. In doing so, the General has made known his views on the subject of the employment of mounted troops based on the lessons of the South African War. He remarks that the value of mounted troops for strategic purposes in war is in direct ratio to their rapidity of movement, and the mobility of such troops must be necessarily dependent upon the quality of their horses and the thoroughness and the completeness of their instruction.

Colonel Fullarton, who wrote a pamphlet concerning the state of agriculture in Abyssinia about 1784, mentions a curious circumstance. He says: "The practice of working with wagons teams or drays has never been established. Even the yoking of two horses in one cart is disapproved of on this principle: that a single horse in a cart avoids the strains and jerks which so frequently distress the willing ones, while the others save themselves."

AGRICULTURAL SHOWS

Richmond, Thursday, 30th July. President A. W. Cooper, J.P. Hon. Secretary, John Marwick.

Mid-Illovo, Wednesday, 5th August. Entries close 15th July; late entries 20th July. Hon. Sec. et al., W. H. Allwright.

Noodsberg Road, 6th August. Entries close 25th July. Mr. H. von Buslow, President. Fritz Reiche, Hon. Secretary.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.

No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.

No. 43a.—Is at present a student at the School of Agriculture, Kutt, near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.

No. 44a.—Young lady of English parentage, who has had two years' training in poultry farming at Lady Warwick's Hostel, and who has also been at Reading College Poultry Farm, is open to accept an appointment for a year or two, where she will be able to acquire local experience of poultry farming.

No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.

No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.

No. 48a.—Englishman of 32. In England was interested both in stock and agricultural farming. Has had ten years' ranching experience in Texas, U.S.A. Produces good testimonials. Is well up in dairying, butter-making, and sheep-shearing and butchery work.

No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.

No. 51a.—Young fellow of 25. Has not had any farming experience, but is anxious to get on farm. Has had ten years' office experience at home.

No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.

No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.

No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.

No. 56a.—Englishman, aged 22. Has eighteen months' dairy experience in Warwickshire; afterwards three years in New Zealand where operations were of an extensive nature. Has a knowledge of station and pioneer work. Considers himself a competent dairy hand.

Weekly Rinderpest Report up to 21st July, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths to date from the 26th May, 1903.
<i>Estcourt Division.</i>			
Sans Souci (fresh outbreak) ...	1	2	1
<i>Zululand.</i>			
Eshowe District	24	34	125
Umlalazi District	6	9	34
Lower Umfolosi District ...	1	..	19
Makhahlala District	29	20	171
Mahlabatini District ...	..	..	43
Ndwandwe District ...	4	6	35
Paulpietersburg District ...	4	..	7
Vryheid District	...	1	26

21st July, 1903,

M. J. HIME
(For P. V. SURGEON).

Pound Notices.

THE following stock, unless previously released, will be sold on the 2nd September next:

Acton Homes.—Two merino ewes hole and half moon on left ear, slit in right ear, branded \square on left side.

Vryheid.—Black mare, both hind fetlocks white, 3 years old; black mare, white star on forehead, near hind fetlock white, branded J indistinctly, 3 years old; bay mare, both hind fetlocks white, 3 years old; dark brown mare, branded F P indistinctly on near hind quarter, about 10 years old.

Dundee.—Red ox, white on upper part of face and under jaws, also under chest, branded on right buttock indistinct, tips off both ears; dark chestnut gelding, white star on forehead, mane has been cut, off hind fetlock white, branded, looks like S 1, indistinct; six well-bred Angora goats, slit in left ears, and tips off right.

Estcourt.—Black ox, white on brisket, also on pisol and between hind legs, upstanding horns bearing backwards, branded on near hind hip W S, indistinct S; impounded by N. B. Scheepers, of Paapkuil, near Estcourt.

Mooi River.—Running on farm "Westfield," Balgowan, black ox, 3 years old, looks like O O or C C, information by Mr. Geo. Webster.

New Germany.—Running on farm "Mariannahill," near Pinetown, dark brown mule, long mane and tail, good in condition, no marks or brands visible.

Howick.—Black heifer, white face, near horn been damaged, wire seton in dewlap, looks as if it had calved lately.

Inhlazatje.—Brown mare, about 13 hands, 3 years old; no brands or marks.

Greytown.—Black ox, white flanks, two ear marks, right ear top and bottom, viz: ∇ , left ear, top V, left buttock, indistinct brand, looks like S; left horn point off, also in distinct brand, looks like S on right side neck, aged, in poor condition.

Running on Green Point.—Two sheep—one ewe with ram lamb, too wild to get near to ascertain brands or marks, ewe sheep appears to have a slit in right ear, young ram, no brands.

Petroscar.—Bay stallion, about 5 years old, hogged mane, no brands, value £8. Impounded by G. E. Duncan; this stallion was impounded for trespass and damage to mares, for which £15 is claimed. The above animal will be sold at the expiry of one month from this date, 14th July, if not previously released.

Howick.—Chestnut gelding, branded H in circle on near hip, 4 white feet with 3 shoes on. The above was advertised in Government Notice, No. 474, 1903, *Gazette* July 7th.

Estcourt.—Black and white bull, piece out of each ear, aged, no brands, probable value £8; impounded by son of B. Scheepers, residing on Wagon Drift. The above animal will be sold at the expiry of one month from this date, 14th July, if not previously released.

Dundee.—Bay stallion, small, long mane, no brands visible, probable value £4; impounded on the 10th July by Native, Fishana, Chief Sotike. The above animal will be sold at the expiry of one month from this date, 16th July, if not previously released.

District Reports.

BERG VILLE (late Upper Tugela), 8th July. —Leaving out lion stories, summarising ones own judgments, and airing personal grievances, it is a difficult matter to contribute any news of interest to your valuable journal. The weather up here is beautiful and bracing, and people could do worse than visit Bergville as a health resort. Since the commencement of the year three new houses have been built, and one is I understand taken as a branch office for Mr. H. B. Oawood, Solicitor, of Ladysmith, and another is to be used as an eating house to feed his native clients. The natives have given up the idea of starving, and are willingly paying forty shillings per muid for Colonial mealies in preference to a much lower price for imported grain. Eggs are very scarce, and the morality amongst fowls is on the increase. Bergville is still in want of trees, railway, school, Town Hall, a daily post

cart, church, and a butcher's shop, but doubtless these wants will in due course be brought to the notice of the Government through the auspices of the Farmers' Association.

W. G. WHEELWRIGHT,
Magistrate.

KRANTZKOP, 15th July. —The weather continues dry, cold and windy. We had a dust storm about three weeks ago which would take some beating. The farmers in the district are now busy reaping their mealies. In spite of the severe drought a few months ago, many of them have fair crops. The greatest sufferers are the Natives living in the Thorns. With few exceptions, their crops were a total failure. The outbreak of rinderpest which occurred some six months ago, has, thanks to the prompt action of

the Veterinary Department, and the energy of the Inoculator, Mr. R. P. Martens, been stamped out. The outbreak was confined to the Thorns, and no Europeans, consequently, suffered loss. It does not redound to the credit of a farming District such as this that farm produce, such as potatoes, vegetables, forage, butter, &c. has to be purchased in other Divisions. Yet such is the case. Excepting mealies and wattle bark, the farmers do not grow produce for sale. One of the largest cattle owners in the Division buys butter for winter use!

G. W. ADAMSON, Magistrate

EMPANDHLENI, 30th June.—The weather has been very cold with exceedingly severe frosts. There was a slight fall of snow on the Qudeni Range again on the 20th instant. The pasturage, especially round this neighbourhood, is getting very bad. No rain fell during the month to speak of; maximum temperature was 70 degrees, and the minimum temperature was 32 degrees. The scarcity of grain is beginning to be felt more in the low country than anywhere, and quantities of mealies are being brought in, the prices running from 30/- to 40/-

per muid. As usual, foolishly enough, some of the natives on the high veld have been selling a few mealies, and no doubt they will have to buy again later on in the season. No locusts have been reported. Rinderpest, I regret to say, has been much on the increase, and has spread badly from the Ward of Sitshitsili into Siyunguza's Ward (upper part), as well as in the Ward of Ndube, towards the Tugela. Mr. T. W. Cooper, Inoculator, is doing good work, but in many places it is impossible to get the natives to inoculate, more so now the cattle that have been inoculated have broken out. The people do not see the force of constantly paying inoculation fees every three months, but would rather have the disease and done with it. Approximately some 77 head have died during the month. I am inclined to think the tick birds assist in spreading the disease. The hut tax has not been paid up so well as last year, but is coming in daily, the total collections to date being £4,762 16s. With the exception of the usual colds, the health of the district has been good. I regret to say Trooper S. P. Eldrid, N.P., while on duty at hut tax collection, was bitten by a large puff adder, and he is still in the Eshowe Hospital.

C. C. FOXON, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. Walker & Co. write:—Trade is far from brisk, and one hears the same complaint in every line of business. Of course mid winter is invariably considered the most quiet time, but it is years since Maritzburg passed through such a quiet time from a commercial standpoint. It is pleasant to have to report that rain has fallen in many parts of the Colony, although heavy frosts have been reported from many districts.

Mealies. Owing to the delay in the new tariff coming into operation, the mealie market has been most erratic. A few Natal mealies are coming forward, and farmers are astonished when told that 19s. to 20s. is their outside value. American grain is realising from 16s. to 18s. in urban. Canadian mealies are also in the market; fine large grain, much larger in fact than North or South American, but they are far from being in first-class condition.

Forage.—Very little offering; and prices are about the same as our last, viz. from 8s. 6d. to 10s. 6d. per 100 lbs.

Hay.—Very little offering, and prices have been almost everything between 1s. 7d. 2s. 3d. and 3s. 6d. per 100 lbs.

Potatoes.—From 4s. 6d. to 12s. and 13s. 6d. per 100 lbs.; sweet potatoes, 3s., 5s. to 6s. 6d. per bag.

Onions.—From 19s. to 22s. per 100 lbs.

Oats.—About 7s. 3d. to 9s. per 100 lbs.

Pumpkins.—From 2s. 6d. to 4s. 6d. per dozen.

Tobacco.—From 5d. to 1s. per lb.

Butter.—From 1s. 4d. to 2s. 3d. and 2s. 9d. per lb.

Eggs.—From 1s. 6d. to 3s. per dozen.

Poultry.—Common fowls, from 1s 8d. to 4s. each; ducks, from 4s. 6d. to 9s. per pair, guinea fowls, 8s. 3d. per brace; turkeys (cocks), 13s. 3d. each; (hens), 7s. each.

Sundries.—Venison, 1s per lb.; mutton, 7½d. to 10d. per lb.; pork, 4d. to 7½d. per lb.; hares, 2s. 9d. to 3s. each; oil cake, 4s. 3d. per 100 lbs.; rabbits, 1s. 6d. to 2s. 9d. each.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, eschalots, lettuce, onions, peas, parsley, radishes, tomatoes, and turnips.

Fruit.—Apples, bananas, lemons, naartjes, oranges, papaws, pineapples.

Firewood.—From 7½d. to 9d. per 100 lbs.; cut firewood, 10d. to 11d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business is flat, and money tight beyond all precedent.

Mealies.—The market is quiet and unchanged; the demand is simply from hand to mouth, and no large parcels change hands.

Potatoes are all prices, and the market is glutted. Best samples bring 14½d. muid; but very good lines are being sold at 12s 6d.

Forage is in full supply at 10s. 6d. per 100lbs. with small inquiry.

All other produce plentiful, and quotations are entirely in favour of buyers.

Onions only are somewhat scarce, but simply in consequence of a bad glut recently.

JOHANNESBURG.—We regret to say that our Johannesburg Report has not yet reached us.

The Agricultural Journal

AND MINING RECORD.

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The Grading of Dairy Cattle.

CONCLUSIONS.

By E. O. CHALLIS, Government Dairy Expert.

IN summing up the three excellent and instructive articles on the grading of dairy cattle, which appeared in No. 12, vol. VI. (July 10, 1903), I do so not with the idea of passing any criticism on the articles in question, but with a view of giving a few ideas on the methods employed in grading up cattle in Natal.

I cannot claim to have had any opportunity of grading up cattle in this Col-

ony myself, although I have in others, but I give my opinions on the subject, through experience gained during the exceptional opportunities I have had of inspecting the numerous herds of cattle in all parts of this Colony, and from an intimate acquaintance of the methods employed here in grading up cattle, and the progress made in this direction since my coming to the Colony some six years ago.

That progress has been made in the right direction of late years in grading up the indigenous stock of the Colony, no one will gainsay. The employment of better-class bulls is becoming far more general every year, and the effect of such employment has already left its mark behind. The importation of good bulls from England has been carried on for many years, in spite of the enormous havoc that red-water has created amongst such animals, and the Colony is to be congratulated in having such men as Messrs. P. D. Simmons, T. Hall, W. R. Anderson, and many others, who have for many years been importing their bulls from home, and have been the means of distributing many excellent grade bulls throughout Natal. But there is still a great need for the more general employment of better class bulls, and every encouragement should be given to those breeders who continue to import fresh blood, as the demand for well bred Colonial grade bulls is always in excess of the supply.

Now, if we take the cattle of Natal as a whole, and judge them from a dairying point of view, I am afraid there will have to be a wholesale culling out of weeds, both in sires and dams, before the general run of our dairy stock can be considered even third class. I am also convinced that many stock owners have been grading down, instead of grading up, their herds, and during my travels through the Colony, I have every now and then come across a really tip-top dairy cow with well developed udder, and every indication of being a first class milker, and on pointing such a cow out to the owner, I have been struck with the reply, "Yes, that is the sort of stock we used to have in Natal in the early days." This, I think, to a great extent bears out my statement that many of our stock-owners have been grading down instead of up. Many reasons for this grading down might be adduced, but the chief reason is, the unfortunate selection in so many instances which a breeder makes in the choice of the bull which he intends to use for the improvement of his herd.

There is a common impression in this Colony that any stock-owner who has an

imported bull is bound to breed bulls quite good enough for stock purposes, and that every bull-calf bred by an imported bull must of necessity be a suitable animal to breed from. A more erroneous impression than this could not prevail, and allowing for the fact that really good grade bulls are very difficult to procure, there is a large percentage of bull-calves annually left for breeding purposes which never should be left. Although such calves have been bred by an imported sire, in many instances their proper place is with the oxen on the farm. There is also another factor which has to be taken into consideration while discussing the point as to whether stock-breeders have been grading up or down, and that is, as Mr. Woods says in his article, "the curtailment of the runs which closer settlement brought about," also the deterioration of the veld, through, in many instances, injudicious burning. There is no doubt that in the early days when cattle had unlimited runs they grew out better, and fewer weeds were to be seen than is the case to-day, but this difficulty can to a great extent be overcome by the judicious culling out of useless animals, and by feeding the stock, especially the young stock, during the winter months, instead of allowing them to fatten during the summer and starve through the winter.

I will now briefly touch on the methods of grading up cattle which prevail in so many instances throughout Natal. I have observed in numerous cases that many breeders who have started grading up their herds, having as a foundation the ordinary Zulu cow, have for several years done fairly well, and the improvement of their stock has been very noticeable; but the job is to keep that improvement up, as Mr. Woods says, and it is here where so many stock-owners go wrong. I have frequently seen breeders who have been using Shorthorn bulls for several years to improve their herds, suddenly do away with the Shorthorn and go in for a Devon bull. Then after a season or two, not being satisfied with the results obtained from the Devon, have tried a Friesland, and then have finally gone back to the Shorthorn with which they

started. Now, no breeder can expect to be successful if he goes on these lines. If he starts with a certain breed he should keep to it unless he has good reasons for changing, and if he does change to another breed he should think the matter well out before doing so, and have some idea what results are likely to follow by introducing into his herd a different breed. I have seen very good results obtained from using a good Friesland bull with ordinary Zulu cows, and afterwards introducing the Devon strain. But this might not always follow, and it would perhaps be sounder policy to make up one's mind, when starting to grade up common cattle, which breed would be most suitable for the purpose, and to stick to that breed, unless, as I said before, you have very good reasons for changing. I think the advisability of sticking to one breed is amply borne out when you come to examine the results which Messrs. Wm. Woods, P. D. Simmons, and T. Hall have achieved in the Mooi River District. These results have, of course, taken some time, and have not been obtained without a considerable amount of trouble and expense, but the result is there all the same, and stands out as an example for other breeders to copy. The results, I say, show what can be produced from common stock if only common sense and sound judgment are exercised in the selection of the sire.

Mr. Woods has been particularly successful in grading up his cattle, especially as he has never used anything but grade bulls, and, as he says, "there is no secret in it." Every stock-owner has practically the same chance, if he only uses the same judgment and common sense in selecting a grade bull of a distinct breed, and avoids introducing into his herd a little of every breed which the Colony possesses.

This brings me to perhaps the most important point in grading up cattle, wherein lies the secret of success, viz., the selection of the sire. Personally, when buying a grade bull in this Colony, I should want to know as much about the dam as I did about the sire of such a bull, before venturing to adopt it for general use, and if I were

buying an adult bull, I should, in addition to this, require to examine carefully the stock it had previously produced.

To produce really good grade bulls great care must be exercised in the selection of both sire and dam. The kind of cow to breed from is one that comes from a heavy milking strain, as it is not enough to merely satisfy oneself that a certain bull was bred from a fairly decent milking-cow, but you must make sure that the ancestors of such a cow were also bred from a milking strain. The kind of cow that I like to see selected specially for breeding bulls should have some of the following points. A well developed udder, which comes well forward and well up behind; this indicates that the hind and fore quarters are properly developed. Teats must not be too small, and should be squarely placed, the milk veins well defined, a large escutcheon (indicating a good flow of blood to the udder), a thin neck, wide forehead, with bright prominent eyes, and lastly, but not leastly, plenty of girth and depth through the body, especially in the fore part where the vital organs are situated, as this indicates constitution and vitality. If such a cow as this is selected, and equal care is exercised in the selection of the sire, we should, I think, see more bulls in the country worthy of the name and fewer weeds in our herds.

I am quite sure that the secret of Mr. Wood's success is in the fact that he never uses a bull which does not possess a first rate constitution, and one which he has satisfied himself has been bred right on both sides. In this way, and in this way only, can cattle be prevented from deteriorating after the first and subsequent crosses.

Mr. P. D. Simmons has very rightly pointed out in his article that all imported bulls are not necessarily good ones, and very great care must be exercised in their selection, as there is no doubt whatever that most inferior animals are often palmed off on the Colonists at high figures, unless such impor-

tations are made through reliable agents. Personally, I think, many of the imported bulls in the past have been bred entirely from beef strains, and this is a point which needs closer attention on the part of breeders, for, if it is the intention to grade up cattle with a view to dairying every effort must be made to import a bull which has been bred from the very best milking strains obtainable.

Mr. Geo. D. Alexander, in his article, has touched on many vital points which effect the development of a herd for dairying purposes. For instance, there must be something wrong when you see forty or fifty cows tied up and milked, and three Kafirs can carry all the milk obtained from this number into the dairy and not be over-loaded at that. That such is a fact, I know only too well, and I am afraid while cattle remain at the present prices it will continue. But the day will surely come when cattle will recede to normal prices once more, and poor milkers have but little value when brought into competition with cows which have had their

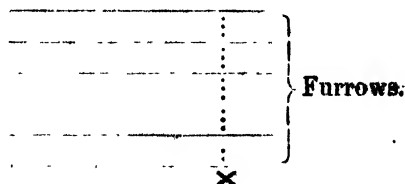
milking capacities fully developed. Stock-breeders may do all they like to grade up their cattle for dairying purposes, but they will never be successful until they have realised the importance of properly developing the milking qualities of their cows. I also defy any man to develop, to their full extent, the milking qualities of any cows, while the present system of rearing calves still remains in vogue. A heifer is either made or spoilt during her first year's milking, and unless the calf is removed as soon as born, and the heifer properly milked twice a day, she will never become a first-class milker, and as years go on she will deteriorate rather than improve.

On such a wide subject as the grading up of dairy cattle I have only touched on some of the salient points affecting it, and, while taking this opportunity of thanking those who so kindly contributed articles on this important subject, I trust others will follow suit and give their ideas in some of the future issues of the *Agricultural Journal*.

Passing Notes.

DISTRIBUTING FERTILISERS.—Recently meeting Mr. Cotton Acutt, the subject of distributing fertilisers in furrows cropped up. I dwelt on the unevenness in distribution which generally resulted when a Kafir was given a quantity of, say, twenty pounds of fertiliser to distribute along a furrow. He said :—"That plan is wrong, and with such a quantity even distribution cannot be expected from an average Kafir. The Kafir should be limited to small quantities, say a pound or two. You calculate how far that small quantity will go, and from the headland you strike off the length for that small quantity. It is easily done. The Kafir or coolie, if he is intelligent enough, you tell to place a stick ten or fifteen yards, or whatever length you decide, down the farthest convenient furrow. He returns to the top furrow, and from the same dis-

tance down that furrow he walks to the erected mark dragging his feet in the loose soil. That gives a line quite distinct enough to show the man who is doing the sprinkling where to end. The sprinkler carries two small tins—one for going down his short length and one for coming back. See here," and he made the sketch below :—



"The cross," he went on, "is the mark, and the dots the shuffled foot-prints, and so you go on till the field is finished. In

this way you minimise the risks of uneven distribution."

VALUELESS POTATOES.—During the conversation I referred to a story I had just heard from Mr. Thomas Stead, of his meeting a farmer at Camp Drift, in the days when potatoes were practically valueless, who was busily engaged in off-loading a load of potatoes into the river. "Oh," said Mr. Acutt, "I can cap that. At that time on one occasion Mr. B. discharged a load of potatoes, for which he could get no sale, on the Market Square for the good of the public. But there were none in those days in Maritzburg who would take the trouble to help themselves to the free tubers. Here comes the point of the story. Three or four days later the benefactor received an order from the Corporation to cart away the potatoes, or they would be removed at his expense!"

BEER YEAST.—Mr. M. G. Jacquemin, the Director of the French Government Laboratory at Malzeville, near Nancy, is reported by the *Journal d'Agriculture Tropicale* to have made some important discoveries in yeasts. M. Jacquemin has developed a process for the cultivation of yeasts whereby their characters can be distinctly altered. He has been enabled to prepare a beer of remarkable good keeping qualities, the brewing of which can be carried on in the tropics, and which is fit for consumption three weeks after brewing, a process which promises to effect a considerable change in the manufacture of, and trade in, fermented beverages. By cultivating *low* yeasts at progressive higher temperatures, he has arrived at the production of a yeast which can work fermentations at higher temperatures than 20 degrees Centigrade. This process should be of much importance in tropical countries, for the reason that it will obviate the necessity of employing the enormous quantities of ice required in the usual processes of brewing. Not only is there an economy of ice, but the shorter duration of the operations will enable a brewery, whether in the tropics or in temperate regions, to yield a greater output without enlarging the plant.

WINE YEAST.—The difficulties connected with fermentation are well known to South Africans who make, and who endeavour to make, wine. From the same source—the *Journal d'Agriculture Tropicale*—we gather that the French colonists of Madagascar have been trying to make wine. The results have been disappointing. Mr. H. Neuville points out the cause, which he states consists in the fact that the grapes arrive at maturity just at the moment of the heavy seasonal rains, and that the rains wash off the natural ferment which is formed on the rind of the grape, and thus a proper fermentation is prevented. In Natal similar conditions as a rule obtain. This natural yeast is characteristic of various vineyards, and it gives the *boîquet* which is characteristic of various wines. He points out that such accidents are not very rare, even in France. He advises the importation into Madagascar of artificial yeasts, which are to be obtained in trade, and by judicious choice of such yeasts the colonists will be able to obtain various flavours suitable to the vines cultivated, and at the same time obtain wines of good-keeping qualities. In Natal the little wine which is produced comes practically all from the Trappist Mission stations. It is to be hoped that these advanced colonists are keeping *au courant* with the progress of science in wine making.

TROUT BREEDING.—The letter, with regard to the spawning of a trout, from Mr. J. C. Parker to the Minister of Agriculture, which will be found elsewhere, shows in every sentence great gratification at the result announced. Since 1899 Mr. Parker has enthusiastically devoted his special knowledge and much of his time to the introduction of trout into the colony. The labour was great, and owing to the immense mortality suffered by the imported ova was often of the most discouraging character. In 1902 two cemented concrete ponds were built at Tetworth—Mr. Parker's farm—for the breeding of trout. In these ponds the fish can be watched, and when fit can be easily caught for spawning. It is from the fish in these ponds that most of the ova for hatching will in future be obtained.

Osiers.

AN application has been received by the Agricultural Department from a Capetown firm for information as to Natal growers who could provide a reliable supply of osiers, for basket ware. The osiers hitherto used have been imported from Europe and Madeira, but there are

many places in Natal where they could be grown if a regular demand could be relied on. Growers having stock ready for disposal, and also intending growers, are invited to communicate with the Conservator of Forests.

The First Spawning of Trout in Natal.

THE following letter from Mr. John C. Parker was received by the Minister of Agriculture on the 26th ult. :—

SIR,—I have the honour to inform you that this morning I spawned the first trout, and obtained about 250 eggs

from her. She was only a small fish about 1½lb weight. The others seem to be ten days or a fortnight off being ripe.

We have made a start, and laid a foundation of an edifice which, I hope, will grow larger year by year.

Central Experiment Farm.

MONTHLY REPORT.

DIRECTOR OF AGRICULTURE—

THE disc ploughs mentioned in my last report have been in use during the month, and may be seen at work daily on the farm. They are doing good work, and have satisfied quite a number of farmers who have inspected them.

The four-furrow plough is drawn by fourteen oxen (eight of these being Madagascar oxen) and ploughs 3½ acres per day. The six-furrow is drawn by eighteen oxen and ploughs 5 acres per day, but, with the oxen in rather better condition than they are at present, 4 and 6 acres respectively could be ploughed. The ploughs are very heavily built and stick to the soil better than some of a

much lighter make that have been tried here. T. Robinson, Melbourne, is the maker, and the cost of six-furrow ploughs is £55 landed in Durban.

The maize harvester and binder, and husker and shredder have not yet been fitted up, but an effort is being made to have them ready for use at as early a date as possible. A strip of mealies has been left on which to try the harvester and binder. The husker and shredder cannot be tri-d until the engine arrives, which, I understand, has now left the makers.

The general work in connection with the different branches of the farm, viz., farm work, experimental work, building, fencing, brickmaking, and forestry work

are all progressing satisfactorily. Preparation is being made for an area of about 20 acres being planted with a revenue crop of potatoes; previous to ploughing 4 cwt. of superphosphate per acre was applied.

I intend planting a few acres of mealies during the present month.

The Field Experimenter is at present engaged in obtaining results from the remainder of the maize plots.

The horses and mules are in excellent condition. The oxen are in fairly good condition, but, having had no proper housing during the winter, they have suffered considerably from the bitter cold winds.

I have now received your elaborate and interesting plans of experiment work to be carried on during the coming season, and, with the able assistance of the Field Experimenter and qualified assistants, it will be our endeavour to execute the work in as successful and systematic a manner as possible.

Three varieties of Russian wheat, "Kubanka," "Black Don," "Velvet Don," deserve special mention this month. They were planted on the flat in February, and at present are showing a very strong, healthy foliage.

ALEXANDER REID,
Farm Manager, Central Experiment
Farm.

Shropshire Sheep.

At the recent Royal Agricultural Show of England, there were 189 Shropshires exhibited in the whole of the classes, and Messrs. William Cooper & Nephews, proprietors of Cooper's Dip, made six exhibits, one for each class, with the following results:—

Pen of five shearling ewes—	First.
Pen of three ram lambs—	First.
Pen of three shealing ewes—	First.
Shearling ram—	Second.
Two shear rams—	Third.
Pen of three ewe lambs—	Third.

Rhodesian Redwater.

THE following is extracted from a lengthy report on the above disease by Dr. Theiler, Government Veterinary Bacteriologist, Transvaal, which appears in the last issue of the *Transvaal Agricultural Journal*:—

There is at the present moment no certain cure for Rhodesian Tick Fever. Neither is there any preventive inoculation, notwithstanding the many and various injections. In such a country as the Transvaal, where the farmer depends greatly on his cattle, every remedy, scientific or otherwise, is tried. Now, the Colony is not yet completely infected, and

when the Government, the farmers and the transport riders work hand in hand the calamity, already forecasted, may be to a great extent averted. Certain districts, Lydenburg, Barberton, and also Swaziland, have become thoroughly infected. They are declared infected areas. Several farms, outside those areas, have also become infected. They have been quarantined. To bring fresh cattle into these infected areas is not only to mean a disheartening temporary loss, but to maintain, moreover, a permanent centre of infection. Again, cattle should not be brought out of an infected into a clean country unless they can be isolated,

entrained, and destroyed within the first few days after their arrival. This must be our policy. Within an infected area the disease will soon wipe out all cattle which are found on the public highway. The farmer, however, who keeps his cattle isolated and prevents any foreign cattle grazing on his lands, and does not allow them to leave his farm, has every chance of escaping the infection. We have shown in the foregoing notes how the disease lingers on an infected veld. Without infected ticks, no tick fever. The life cycle of a tick probably lasts longer than six months, but probably not much over a year.

Accordingly, when no cattle are kept on the farm, the tick will finally die out and with it the disease.

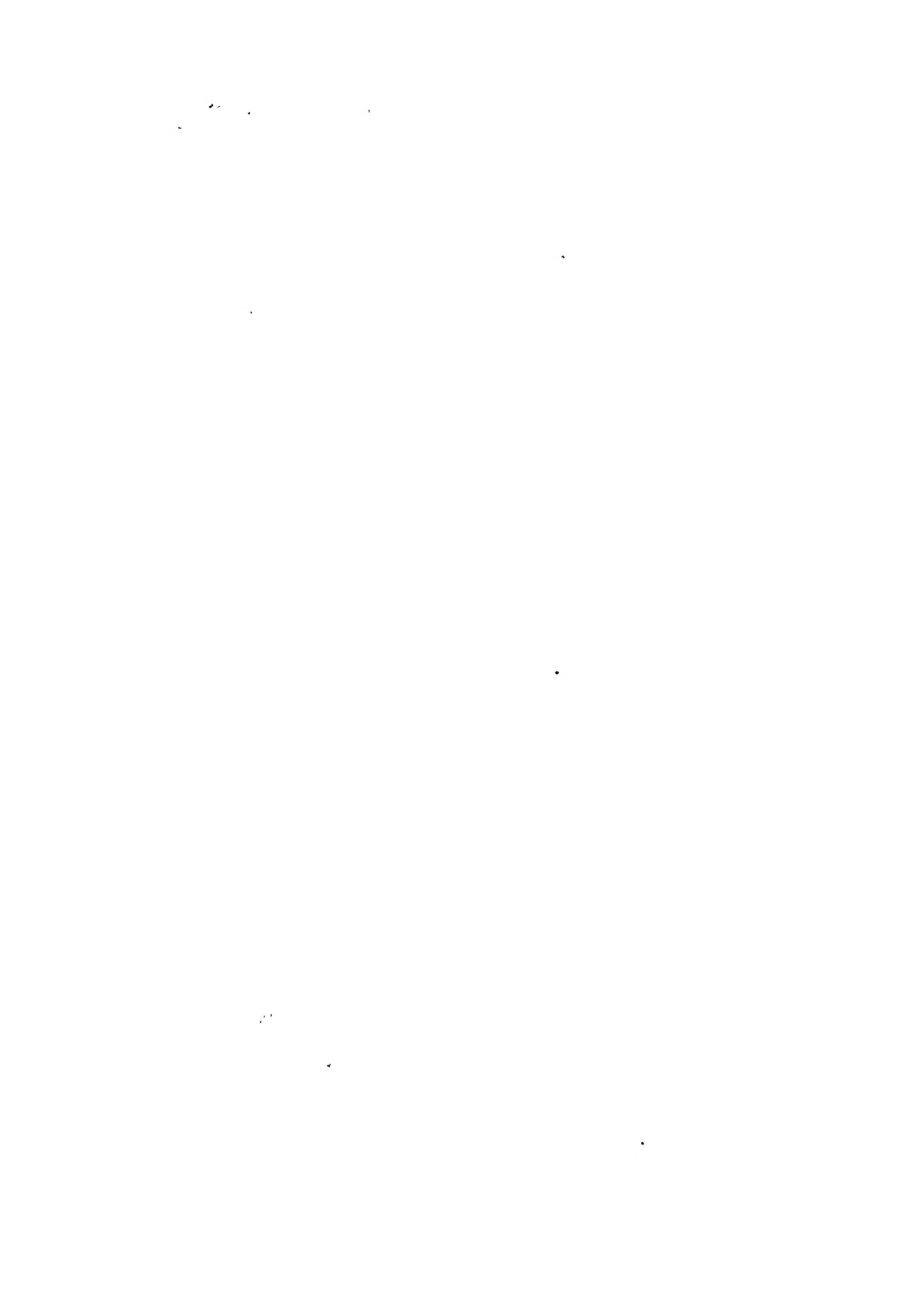
The tick may feed on other animals than cattle, but these animals, not being susceptible to the disease, will not contract it, and the offspring of a female tick from such an animal has no chance of becoming infected. This reflection may guide our policy in stamping out the infection. It is useless to say that without cattle the farm work cannot be done. Cattle on an infected farm will always succumb, and, consequently, the disease will always remain.

According to Mr. Gray, Principal Veterinary Officer for Rhodesia, there is no sign that the disease has become any milder in that country where it has been longest known. The death-rate remains the same, and young calves contract it as before. Thus infected farms should be worked with other animals than cattle, and until such times we know definitely that an area has become free from infection. Once the disease has made its appearance in a herd, the cattle should be brought out of range of the infection without delay. Naturally, the tick will be taken out too, and the new area will become infected. Therefore, the cattle should be thoroughly washed with tick-killing liquids, and this washing should be repeated several times within the following 14 days. As long as the animals continue to die, the washings should be kept up. It is possible in this way to get rid of the infection, and the surviving stock will be comparatively safe. Of course, this moving of cattle will not be permitted outside the quarantined areas.

In districts which have become partially infected, and where public roads might be infected, all moving of cattle should be done with care. A farmer who has got breeding cattle and transport oxen should separate the transport animals from the others, and allot to each herd a separate piece of grazing paddock. Should the disease then break out among the cattle used for transport, he still has his breeding cattle safe.

It will be wise for farmers who have to move their transport oxen on roads which might be infected to dip them regularly before they return to their grazing ground. Public dips will be erected by the Government, and placed at the disposal of the farmer. It may be stated here that dipping of cattle on a road which has become thoroughly infected will not prevent such cattle from taking the disease. Young ticks will very soon again infest an ox, and, although he may live longer than a non-dipped animal, he will finally become infected and probably die. On the other hand, constant dipping will help to reduce the tick plague.

Of the four hundred or more varieties of the peach in America, perhaps none has wider dissemination and received more popular favour than the *Elberta*. It originated in Georgia, and was discovered by Samuel H. Hump. of Marshallville, who selected it as the most promising of several hundred seedlings he produced from seed planted in 1870. In parentage it comes from our very best strains of peaches, and is presumably a cross of Chinese *Cling* on *Early Crawford*. The tree is a vigorous grower, with an unusually strong healthy foliage. The fruit is large and highly coloured, and has most excellent shipping qualities. It is well adapted to a wide range of conditions, and is at present the most universally planted commercial variety in this country. In quality it is good, but some others are superior in delicate texture and flavour. Owing to its size and handsome appearance, it is one of the most popular peaches on our general market. It is claimed by some well-informed fruit growers that the peach-growing public has gone "*Elberta* wild." It is feared that with the enormous number of these trees planted, markets will be overstocked with this variety in some sections, thus interfering with the price usually received for this product. The season varies with conditions. In Georgia, in 1901, it was at its best from July 20th to August 5th; while on the Chesapeake Peninsula, August 20th to 30th was the date. While the *Elberta* is without doubt a good commercial variety, it should not be planted to the exclusion of others of equal merit.—*American Agriculturist*.





Cryptomeria elegans.
(Height, 60 feet ; girth, 5 feet 4 inches ;
age, 16 years.)



P. pinaster.
(Height, 65 feet ;
girth, 7 feet ;
age, 50 years.)



Pinus insignis.
(Height, 70 feet ; girth, 9 feet ;
age, 22 years.)

Photo by Editor.

TREES AT LYNEDOOCH (MR. JAMES KING).

The Culture of Eucalypts.

By T. R. SIM, F.L.S., Conservator of Forests.

IT is a curious fact that the trees which give Natal its noted landscape beauty, and which draw the attention of visitors, are, for the greater part, exotics, introduced and naturalised within the past forty or fifty years. This is more particularly the case along the lines of railway, whence indigenous "bush" has almost disappeared, while a very considerable area has been planted with Australian Gums and Wattles, which are dotted all over the midlands, and not quite absent either on the coast or in the more inland districts. The adaptability of these kinds to local conditions and their rapid growth have secured for them an amount of attention which the more slow-growing and fastidious indigenous species were, in the presence of these, not considered deserving of, and now some introduced kinds have started seeding the country and taking possession. The Black Wattle industry has already developed into one of considerable importance, and the culture of Gum trees only requires careful handling and guidance to make it also an industry well worth commercial attention. Up till now commercial Eucalypt culture has been almost confined here to the growth of Blue Gum (*Eucalyptus globulus*) with which I dealt in a recent paper. Fortunately, however, a large number of other species have been planted experimentally throughout the Colony and now show the comparative results obtainable under different conditions; unfortunately, these experiments have in almost every instance been confined to small sample lots of a few trees or a few hundred trees, so that a timber industry on extensive commercial lines, in even the best known and highly valued kinds, has still to be started. A very few planters, among whom may be mentioned Mr. Topham, Mr. J. Medley Wood, A.L.S., Mr. Jos. Baynes, M.L.A., and the late Mr. Wilkinson, have done much to keep themselves and the public informed concerning the comparative value of the kinds introduced, but to the

average planter a gum tree was a gum tree, and nothing more, whether it was a Jarrah, a Karri, an Iron bark, a Stringybark, or a Blue-gum. This still holds good, and while the public now recognises that there are valuable as well as useless gum trees, few know even now which kinds to plant, or which to avoid. Many hundred species of *Eucalyptus* have been described; at least 130 of these are maintained as distinct species, and the number of intermediate forms and probable hybrids is very large indeed. Some are dwarf shrubs, several are trees attaining 100 feet height; some are useless for timber purposes, others most valuable timbers; some are tender coast species, others hardy mountain kinds; some are fastidious as to soil and moisture, others show no such trait. It is then desirable to have a ready reference to such information as is available with regard to the behaviour in South Africa of each of the more important species especially with regard to growth; for only in a few instances has the timber come to such maturity here as yet as to show its technical properties. The notes given hereunder are, except where otherwise mentioned, from my own observations in Cape Colony and Natal: but with respect to the timber value we must in most cases accept the testimony of Australian experts, knowing that the climatic conditions here will usually produce similar quality of timber, *when fully mature* as is produced under similar conditions in the native habitat of each species; and such expert evidence has accordingly been included. It has also been considered desirable to introduce references to the reports of culture of various species in other parts of the world, especially in Southern California and Arizona, where climatic conditions much resemble those of Natal, where Eucalypt culture is of about the same age as in Natal, and whence reliable information has just come to hand in a United States report.

CULTURE.

Seed.—Wherever it is possible to obtain seed from trees in one's own neighbourhood that should be done, especially if from an isolated tree, or from a clump of one kind distant from other kinds. In such cases hybridization is less likely, and the result is a crop of trees of one variety and of equal growth, while more or less naturalised seed may be relied upon in preference to that from a different climate, and there is at least the advantage of being sure the seed is fresh. Where many kinds are inter-mixed, hybridization is almost sure to occur; this may not be objectionable if only fuel or temporary props are wanted, except that it produces some trees more vigorous than their neighbours, which are consequently dominated, but in the production of good timber an equal kind and quality throughout should be aimed at, and hybrids are then to be avoided. Seed purchased from Australia is frequently mixed, though the more important kinds are usually pure, being collected in quantity from single large trees felled for timber.

The seed is always and naturally mixed in the capsules, more or less, with chaffy seed-like material, which is often difficult to separate from the seed and sometimes indistinguishable. This chaff leads many to sow too thinly, considering that they are sowing a very large number of seeds while actually they are only sowing a few. Clean seed, that is seed clear of chaff, is worth many times as much as the same weight of undressed seed.

In collecting the seed, if a tree has been felled or a branch lopped, collect the mature capsules only, and do so on the day of felling, or, at latest, on the next day. These may be left to dry in a tin or box, and stirred occasionally to make the seeds fall out of the drying capsules, but it is preferable on the first bright hot day to spread out the capsules on a cloth or roof-iron fully exposed to sunshine but not to wind, and to turn the capsules occasionally. By this means almost all the seed will be shed in one day. If the capsules are not collected from the trees soon after felling the seed will be already shed.

Sowing.—The seed may be sown either in well-prepared open beds, or in tins or

boxes. The seedlings are more easily controlled in tins, as in beds the taproot is apt to grow too vigorously, and form insufficient lateral roots, whereas the check produced by the tin induces abundant lateral roots and no development of tap root. In either case the soil should be well drained and in fine condition, with a level fine surface upon which the seed is sown and covered with a light sprinkling of fine sand or sifted soil, the seeds being barely covered. If sown a half-inch deep, or if roughly raked in, they have every chance to be buried, and fail to germinate. The bed or tin should be kept moist and shaded under a calico awning or a light covering of dry grass until germination is completed, after which the shading should be gradually removed, and the plants hardened by exposure, at first at night only, but afterwards by total exposure except under bright sunshine.

Transplanting.—The most convenient method of handling gum seedlings is to prick them out into half paraffine tins, having holes punched in the bottom and thoroughly drained. Twenty-five to thirty seedlings, two inches high, can be put separately in each tin, and grown on until they are four or five inches high, when they are ready for planting out permanently. If the seedlings have been raised in a bed they may have too long taproots to allow them to be pricked into tins; those taproots require to be pruned back to not more than two inches length, and to be planted straight (*i.e.* without being bent round), and if the plant is so vigorous as to be likely to suffer by pruning, then the stem also should be pruned back to about two inches length. The plants should then be shaded again for a few days.

Teasing.—Sometimes, when tins are scarce, resource has to be had to the method of "teasing" the roots in the nursery beds; that is, lifting and replanting the seedlings frequently in the nursery, so as to produce few main but numerous lateral roots. These plants are by this means kept more or less stunted and thrifty while in the nursery state, and when at length they are ready for planting out, and the sites ready for them, they are wrapped separately in little masses of stiff clay, and planted in that

condition. At Johannesburg this used to be the favourite method of moving gum-transplants from the nursery to the plantation for planting out, and many million trees have been thus treated, often moved for considerable distances, the clayed roots being packed tightly together in large cases. I do not recommend this method where tins are available, but mention it as practicable if necessary.

Planting Out.—For extensive plantation work the trees should not be more than six inches high, nor less than three, when planted out. Larger trees require special care, and are apt to die off even then; and smaller trees hang too long before asserting themselves, and are apt to get lost among weeds, unless specially cared for.

The soil should have been well prepared by ploughing and pulverising some months previously, and should be mellow and friable. The plants are brought to the ground in the tins, and removed one by one, just as the operator is ready to plant each. The ball of soil around the root should be kept as intact as possible, and the rootlets spread horizontally in the bottom of the shallow hole dug with the trowel for its reception before being covered up and the soil pressed firm. One good watering to settle and moisten the soil is usually all that is required, if the planting is done, as it should be, during the rainy summer months.

Espacement.—This varies with the kind, and the purpose for which the plantation is being made. For timber, most kinds should be planted five feet apart each way, but thinned as soon as the canopy can be kept close by the remaining trees. Branching kinds require to be kept close longer than others, on purpose to control the tendency to branch. The most rapid growers may, in clean deep soil, be planted ten feet apart each way. For shelter and ornament even wider planting may be adopted. For timber purposes, however, the trees should be close enough to prevent heavy branches ever being formed, height growth should be induced, and rapid, clean, untwisted timber aimed at, the espacement being the main means of control of all these.

Sowing in Situ.—Though not a usual proceeding, and likely to be often a failure, some growers have been successful in sowing gum seed broadcast, where the trees are to remain. To do this successfully it is necessary to have the ground all ready, waiting the advent of heavy rain; and when this is fully expected harrow to a fine surface, and sow, leaving the rain to do all the covering that is necessary. Where kinds are acclimatised this process goes on naturally, self-sown seed coming up freely in some cases. Thinning to the necessary distance apart, or filling up if necessary, should then be done during the first or second year.

Peculiarities of Species.—While in the nursery stage some kinds require more care than others. Thus *E. diversicolor* and *E. citriodora* are apt to suffer from even slight frost, and consequently require to be covered if frost is expected; *E. citriodora*, *E. ficifolia*, and *E. marginata* grow so vigorously that they are apt to suffer when transplanted unless cut back; *E. leucoxydon* is apt to have a procumbent habit during the first year; while many species send their roots through the tins into the soil below, except moved from one place to another, and the extending roots removed, every few days.

Trees for ornamental and shelter purposes are often grown on to a larger size in separate tins, and sometimes only planted out when several feet in height. Such trees require different soil preparation, as ploughing does not alone give sufficient depth of loose soil to meet the requirements of the larger ball of roots. A separate hole for each then becomes necessary, but this hole should be as wide as possible, but of comparatively little depth. A deep hole almost invariably becomes a water basin, in which the roots are confined and suffer, and eventually die, consequently the whole planted area should be turned over to the same depth.

Fencing.—It is absolutely useless to plant trees without first fencing the ground, as stock invariably find access and usually do permanent injury. Some species, as *E. corynocalyx* and *E. Gunnii*, are readily browsed by stock, others are distasteful to them but still suffer through being tramped down or rubbed against.

REMARKS CONCERNING SPECIES.

EUCALYPTUS ACMENOIDES, SCH.

"WHITE MAHOGANY."

Known in South Africa only in its younger stages; of rapid growth in deep alluvial soil, but a total failure in the sheltered valleys among the calcareous coast sand dunes at East London. Seedlings have opposite leaves and branches, like *E. pilularis*, but the leaves are wider and shorter. In New South Wales it grows to be a large tree; its timber is said to split easily and be durable, and useful for building purposes, flooring boards, slabs, rails and palings. Maiden states (Notes on the Commercial Timbers of N.S.W.): "It is one of the most durable timbers in New South Wales. I know of posts of it in different parts of the Colony quite sound after the vicissitudes of more than half a century. . . . It is a tough, strong, useful timber. . . . It is one of those timbers which is not as well known as it should be, because it has been constantly confused with others. It is excellent for posts, piles, girders, &c., and is useful for general building purposes." Formerly included as a form of *E. pilularis*.

EUCALYPTUS AMYGDALINA, LA BILL.
GIANT GUM.

This species occurs in several varieties, under different common names, in Tasmania, South Australia, Victoria and New South Wales. It is usually within the influence of sea-breezes, and prefers humid mountain glens, where, in deep alluvial soil, it produces probably the tallest tree of the world, measurements of over 400 feet in height and 30 feet in diameter having been recorded from the variety *regnans* (the Victorian Blackbutt). On dry ridges smaller growth but more close-grained and durable timber is obtained from the smaller-leaved variety, which, in its seedling stage, much resembles *E. viminalis* in its warty branches and narrow opposite leaves. Concerning its timber Mueller states:—

"The timber is useful for many kinds of carpenter's work; in drying it does not twist: when straight stems are produced in forest-valleys the wood splits better into palings than even that of our

stringybark tree, and this with such facility, that in some particular instance a laborer has split 620 palings of five feet length in one day; the timber is comparatively not heavy as it floats in water, unlike that of many other Eucalypts; it is particularly well adapted for shingles, palings and rails, and also drawn into use for shipbuilding, especially keelsons and planking, but it has not been found very lasting underground, and does not afford a superior fuel."

The timber appears, however, to vary in accordance with the variety and the conditions of growth, and in the pamphlet issued by the Tasmanian Government, the variety *regnans* is recommended as of great strength and excellent for furniture-wood, though not durable in the ground or when exposed to the weather, while the narrow-leaved variety from the dry ridges, known locally as "Peppermint," is said to supply the most durable wood of any of the gums in the state, and to be in special demand for fence posts.

This species yields a very large percentage of volatile oil, and as it endures moist heat better than most other species, it may be useful for hygienic purposes in the coast malarial districts of Zululand. It also endures a lower temperature than Blue-gum (*E. globulus*), and many good specimens exist throughout Natal and Cape Colony, though being mostly under twenty years of age, they seldom exceed eighteen inches diameter and eighty feet height. In the higher districts it is not so vigorous as *E. viminalis* and *E. rostrata*, and on hard dry ridges it is seldom satisfactory, but in alluvial bottoms in the midlands and coastward its growth is excellent. Habit tall and upright, with a distinct main trunk, and small drooping twigs. One variety—*E. angustissima*—has an equally good habit as a timber tree, but leaves only two to three lines wide; in ornamental planting this variety is very desirable, as its appearance differs altogether from any other gum.

Concerning the behaviour of *E. amygdalina* in North America, McClatchie writes: "The tree endures low temperatures, but is injured by dry heat. It does best near the coast and at moderate elevations in well-watered mountain regions. In no part of the South-west do the requirements seem fully met."

EUCALYPTUS BOTRYOIDES, SMITH.

Usually a flat-topped spreading tree, admirably adapted for street tree-planting and other ornamental work, its horizontal leaves and medium height producing a dense canopy twenty to thirty feet above ground. It is frequent in Natal and in the Eastern Province, Cape Colony, where it is hardy up to 4,000 feet alt. Grows rapidly but does not produce a heavy stem early. In Australia its timber is recommended by Mueller and Bailey for waggon-work, knees of boats, fencing, posts, &c., but several forms occur, having different vernacular names in accordance with habitat as it frequents coast sands as well as alluvial soils, and probably on account of this diversity of situation it is not always esteemed equally.

EUCALYPTUS CALOPHYLLA, R. BR.**RED GUM OF WEST AUSTRALIA.**

This species, which is easily known by its very large urn-shaped capsules, is, during its earlier years, one of the most beautiful trees in cultivation, having large deep-green parallel-veined leaves, and abundant panicles of large white flowers. Except on rich alluvial soil it does not however maintain its beauty, and on shallow soils soon becomes a stunted scraggy tree of small size. It is often used for street tree planting where the soil is deep, and frosts not severe; but never realizes here the descriptions given of its growth in West Australia, where it is said to be a fairly large tree, producing strong light timber useful for rafters, spokes and fence rails, but not durable. Frequent in the coastward districts of Cape Colony and Natal, but I cannot recall a specimen one foot in diameter, or more than twenty-five feet in height. Along the North Coast Railway it is, as might be expected, making poor growth in shallow soil overlying shale.

Concerning its cultivation McClatchie states:—"In America it has succeeded only in the warm coast regions, failing entirely in the dry interior plains and valleys. In no locality has the rate of its growth been such as to give promise of much usefulness as a forest tree.

EUCALYPTUS CITRIODORA, HOOKER.**LEMON-SCENTED GUM.**

A great favourite when young on account of its strongly-scented foliage. It grows rapidly, forming tall, straight, unbranched stems, having clean white bark, and only sparse foliage at the top. It is consequently not a shade tree, but in the production of straight spars it equals Blue-gum, and surpasses almost all other species. It is tender in upland districts, but succeeds in more tropical climates than most other gums, and may be found useful in the malarial coast region of Zululand, which is too moist and hot for Blue-gum. The seeds are half-inch long, and the seedlings so vigorous that they transplant with difficulty; the surest method is to prune hard back when transplanting. Concerning its timber Mueller states:—"The hardwood of *E. citriodora* is used for studs, which, after twenty years, shows no decay; it is furthermore liked for fencing, as it splits well, also for shafts of drays, as it is more pliable than most other Eucalyptus-timber, bending readily, and it is also used as material for wheels." Maiden also recommends it for fencing, implement handles, shipbuilding, paving, railway-ties, bridge-building, lumber for inside woodwork of homes, carriage-making, and for railway coaches; and McClatchie, who reports favourably on its growth in the frostless coast regions of North America, adds that the value of the timber is due to its strength, elasticity and beauty, and that it is said to be replacing America hickory, in Australia, in coach factories along the coast.

Frequent in Durban, Maritzburg and Ladysmith, also in East London, King William's Town, &c., usually doing well, and it does not appear to suffer readily from White Ants. Considered the more tropical form of *E. maculata*.

(To be Continued.)

It is said that a New York dentist has been successful in the filling of 11 teeth of Anna, an £800 saddle mare, belonging to Mrs. Seligman, a society woman. The horse was treated like a human being, the nerves being deadened with cocaine. Gold was used for the teeth that show, and silver for the others. The horse could not eat before the operation, but now tackles its oats with relish.

Messrs. Hulett & Sons' Sugar Mill.

THE OPENING.

By ERGATES.

ON the 13th ulto. the fine sugar mill, which passengers on the North Coast railway see from the Tinley Manor Station, was opened by Sir Liege Hulett, the managing director of Messrs. Hulett and Sons, Ltd. Opening, or starting, is perhaps hardly the correct word, for through some misunderstanding only one of a number of trucks already loaded with cane at Darnall was delivered to the mill. Everything, however, to the smallest detail was ready for receiving the raw material, and for the satisfaction of Sir Liege the machinery was set in motion.

The mill house is a handsome structure of brick, as the photograph will show. The situation, by reason of its proximity to the railway, the amplitude of flat open space, and the abundance of excellent water from the Umhlali River running close by, is admirable. The main building is 200 feet long, 48 feet wide, and 30 feet high. About half of the bricks necessary were made from an excellent bed of clay near to the mill site. The machinery comes from the well-known firm of McOnie, Harvey & Co., Glasgow. There was, of course, much deliberation before deciding with which firm to place the order, and owing to the fact that the Juba or Uba cane of Natal is very different in character from the cane of most other sugar countries, it became desirable to introduce modifications or special features in the plant. The mill and its adjuncts—electricity throughout, pumping plant which supplies 60,000 gallons per hour, weighbridge up to 40 tons, houses for employees, etc., have so far cost £27,000.

The mill was designed and erected by Mr James Smith, of Glasgow, who, since 1875, has been engaged in erecting mills in many parts of the sugar world, including Peru, Brazil, Fiji Islands, and West Indies. Two years ago he put one up at Porto Rico, having a capacity of 2 tons per hour, that is to say, about twice as

large as the one being described. The largest mill with which Mr. Smith has been connected is one at Trinidad, which has an output of fully five tons per hour. The largest in the world is in the Hawaiian Islands. The Director of Agriculture was present for the purpose of witnessing the starting, and we were led through the mill by Mr. Smith. We followed the course the raw product takes until it becomes the finished article of commerce, and that involved plenty of straightforward walking, ascending, descending, and re-ascending. I will endeavour to give a rough outline of the process of manufacture.

Let it be supposed that a quantity of cane has arrived. The railway trucks go down a double-line siding, which brings them alongside a broad elevator, which enters through an opening to the rollers inside the building. The rollers are twenty-six inches in diameter, and there are two pairs of them. The crushed cane or megass after passing the second set, travels upward on the elevator till it passes out of the main building and falls into a hopper at the top of the boiler house. The hopper when filled is emptied into a large truck which runs on a tram line, and down "shoots" to the furnace the megass is forked. Two men are required for this duty, and this is the only hand work for the cane after it has left the railway trucks.

Now to come to the juice extracted by the rollers, or mills to be technical. First of all the liquid falls into a tank where it is sulphured and limed. Then it passes to a super-heater, which brings it instantly to boiling point. Now it is discharged into five clarifiers, and from the clarifiers it goes into three eliminators, where it is further cleaned; the last is a process which is not yet common in Natal. From the eliminators it passes to the subsidiers, where it is allowed to settle, and then the juice goes to the tripple effets. which are of 3,000 galls.

per hour capacity. Thence it passes through the vacuum pans, the first being of five tons and the second of eight tons capacity. The juice, which now becomes known as masquit, is "struck" or allowed to flow into large tanks placed below. The masquit is now ready for treatment of the centrifugals—the whirling out of all moisture. There are six of them and they are of the Weston type. The processes of manufacture are ended, and we have the finished article—cured or purged sugar, which is received on a large platform some ten feet high. Along this platform come the railway trucks—there is room for two at a time—and into them from the platform the bagged sugar is easily stowed. If the reader is not already in some degree familiar with the interior of a sugar mill, I am afraid the description will convey but little capable of his apprehension: for him, further elaboration would be of no interest. The chief point which would strike a casual visitor, is the ingenuity displayed in the construction and arrangement of the maze of machinery, and in the general design of all the arrangements for the saving of labour. In these respects I gathered that the mill has no equal in South Africa.

The scums arising from the different tanks are received in two large tanks, and are heated in the usual manner and allowed to subside. The clear juice is then drawn off, and the remainder is forced through two filter presses from the monté jus. The liquor is then in a condition for mixing with the clarified juice in the eliminators.

The furnaces are constructed according to the past experience of Mr. Smith, and are designed to burn, to most advantage, green megass, wood or coal. The fire bars, which are unusually light and thin, are placed nearly horizontally. So far back as 1875, Mr. Smith adopted the plan of placing the bars at an angle, but after long and varied experience, he has for some time abandoned that system. The furnace, six feet by three feet six inches, is arched and lined with fire bricks. The flame passes underneath the boiler, and returns along both sides of the boiler, and lastly through the tubes of the boiler. There are four multitubular boilers, which can each easily produce 100 i.h.p. with green megass only. The chimney

into which the boiler flues lead is 147 feet high—the highest in the Colony. In 1881, Mr. Smith first adopted the system of burning green megass, and was therefore among the very earliest to give up the old drying system.

While the mill is running about five acres of cane will be daily required, and for working the mill some fifty-five coolies will be necessary. The output will average thirteen tons of sugar per day. The sugar growing and making section of the business of the Company is under the supervision of Mr. Albert Hulett.

A question which is always of interest to Natal planters who supply mills, is that of the system of payment. On this subject I had some conversation with Mr. Smith, and, as he has had long experience, his opinion should be of value. He said that in most parts of the world the cane is bought without reference to the sugar contents of the daily deliveries. This plan was found to give the least misunderstanding and trouble, and to be of the most satisfactory for the planter and the miller. In the West Indies the cane varies considerably during the crushing season in the richness of the juice, still, under arranged prices, both parties were satisfied. The testings in actual practice, while general milling was going on, were delusive. Buying the cane subject to a sliding scale on the monthly fluctuations in the price of sugar can be easily arranged, and is the best commercial basis.

The sugar industry of Natal is a paying one. A cane which admirably suits the soil, climate, and labour conditions, has been discovered in the Uba; there is moderate protection, there are special railway rates, and, above all, there is a large and growing home market. That the mill just erected will get its fair share of prosperity there can be no doubt; it is up-to-date in every respect, and in probably no other industry is the demand for the best and latest of mechanical appliances so imperative as in that of sugar making.

It is reported the United States Department of Agriculture has discovered a minute insect, which, if turned loose at the proper time, will attack and kill swarms of grasshoppers in the space of a single night.

Veterinary Departmental Report for June, 1903.**ABSTRACTS FROM REPORTS.****MINISTER OF AGRICULTURE—**

I HAVE to report as follows for the month of June, 1903 :—

Scab.—Eighteen fresh outbreaks have occurred during the month—Klip River County, 8; Vryheid, 2; Newcastle, 1; Weenen County, 1; Zululand, 1; Umvoti, 1; Upper Umkomanzi, 1.

Lungsickness.—Eight fresh outbreaks have occurred during the month—Vryheid and Paulpietersburg, 1; Weenen, 1; Zululand, 1; Indwedwe, 1; Umlazi Location, 1.

Redwater.—Three deaths have occurred in Klip River Division during the month. No deaths have been reported from the other parts of the Colony.

Anthrax.—One case only reported during the month from Umvoti County.

Glanders.—Four clinical cases have been destroyed during the month, and two which reacted to mallein.

Rinderpest.—This disease does not now exist in Natal. There are two centres of disease in the New Territories, and for Rinderpest in Zululand I refer you to D.V.S. Tyler's Report.

Quarter-evil.—Thirty-four deaths from this disease have been reported—12 in the Coast Districts, 3 in Klip River, and 19 in Umvoti County. These cases are rather unusual for this time of the year. They have occurred amongst uninoculated stock.

Rhodesian Disease.—This disease, as you are aware, made its appearance at the Ingwavuma. We have made careful enquiry as to the source of infection, but up to the present have been unable to trace it. The Borders of Swaziland and Portuguese Territories in this neighbourhood have been carefully guarded for months past, and the Magistrate assures us that no strange stock has crossed our Borders. The disease has, as you know, existed in Swaziland for some months, and the fact of it breaking out at the Magistracy points rather to the infection having been brought by other animals than cattle,

that is, animals accompanying travellers may probably have brought the infection. It would be practically impossible to prevent natives with their dogs from travelling about the country. At the beginning of the outbreak, all the infected cattle remaining, consisting of some 23 head, were destroyed, as it was thought that by this means, and by preventing animals from going on to the infected veld, the disease might be checked. It was thought at the time, that the veld infection was confined to one centre, but subsequent outbreaks have shown that veld infection was more widely spread. We have not continued to destroy any further lots of infected cattle. If by destroying infected cattle we did away with the infection, such a policy would be justified, but after the cattle are destroyed *the* source of infection, viz., the veld, still remains, and we are therefore not justified in spending public money in this direction. Stock Inspector Bowles is in charge at Ingwavuma, and has strict instructions to see that no living ticks exist on the infected and in-contact animals. They are dressed daily for ticks, and as the number of animals to be dealt with is not great, this can be carried out in a practical manner. Other animals on the infected areas are also dressed for ticks. From information we have regarding this disease it would appear that, to destroy all living ticks on infected animals, and to keep the animals free from ticks, is equivalent to destroying the animals themselves in so far as preventing spread of infection from such a source is concerned.

S. B. WOOLLATT,
P.V. Surgeon.

10th July, 1903.

MOOI RIVER.—D.V.S. VERNEY.

Sheep Scab.—With scarcity of food, and consequent poverty of sheep, this disease is on the increase.

Rinderpest.—There are no fresh outbreaks of this disease, and the quarantine in the absence of any further sick cattle, should soon be removed from Mr. Comins and his neighbours.

Biliary Fever.—Two very valuable mares have succumbed to the effects of biliary fever. The cases were extremely acute and rapidly fatal, pregnancy being entirely responsible for this, both mares being heavy in foal. I was asked to make a *post-mortem* examination of one of the mares, and found the icteric or biliary infiltration of the tissues was present in the foal, and from its condition, appeared to have been dead a day or so. It was this, I think, that was largely responsible for the sudden and alarming symptoms shown by the mares. These mares were South Americans, and I am rather inclined to think that South American horses develop biliary fever more acutely than horses from other countries.

DURBAN.—D.V.S. AMOS.

The importations by sea during June have been:—

Sheep, 970 ewes, 51 rams, 593 wethers ..	1,614
Mules	246
Horses	156
Dogs	61
Bulls	11
Cows	7
Goats	4
Pigs	1
Ox	1
	<hr/> 2,101

Of the sheep, 877 ewes and 593 wethers came from New Zealand, and were very good sheep. Some were crossbred Lincolns, others Merinos. 81 ewes came from Australia, 12 ewes from Cape Colony, and 45 rams from England—the latter being Merinos. The mules and 148 horses came from Argentine—5 horses came from England and 3 from New Zealand. Amongst the 61 dogs were 20 harriers, which came from the Marquis of Exeter's pack to the 2nd Northamptonshire Regiment, Pretoria. All the bulls came from England, and included 7 South Devon

bulls. The cows came from England, and the goats from Cape Colony.

Lungsickness. I regret to say, extended amongst the cattle of Mr. J. Kirk, of Pinetown, and was accountable for a fresh outbreak in cattle in the Umlazi Location on which I have specially reported.

Glanders.—One outbreak was reported, and a case of farcy was destroyed.

Foot and Mouth Disease.—All the animals on board the two ships that arrived affected with this disease were destroyed at the outer anchorage, and the ships were disinfected before being allowed into port. I have sent a final report with minute on this subject.

Tuberculosis.—One bull was tested but did not react. The kennel for quarantining of dogs at the Compound is now complete, and is already occupied by the seven dogs now in quarantine.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak occurred during the month. This is the only flock now under license in the District.

Lungsickness.—None.

Rinderpest.—As there have been no fresh cases during the month, I think the outbreak in the Tugela Valley may now be considered to have been stamped out. This was practically accomplished some three months ago, but as the disease was so rife on the Zululand side of the river, this district became re-infected after an interval of six weeks.

Quarter-evil.—This disease was very prevalent on the farm Highbury, near Greytown, about nineteen head of cattle dying during the month. The owner, unfortunately, had not had recourse to vaccination, but appeared to have more faith in giving the animals a dose of saltpetre once a fortnight or so. If inoculation is resorted to, as recommended, the disease should soon disappear.

Anthrax (Melt-sickness).—A case of this disease occurred on the farm Muirton, near Dalton.

General.—A case, which should be of interest to horse-owners, came under my notice during the month. Six horses were each given at night one table-spoonful of Little's Dip in a whiskey bottle full

of water, as a remedy for worms. The next morning two were suffering from violent abdominal pain, heaving at the flanks, straining frequently in their attempts to void both faeces and urine, and looking generally the picture of misery. In both cases the action of the heart was much depressed, one animal especially being almost pulseless. With the aid of stimulants, raw linseed oil, and demulcents both animals made a good recovery. The other four showed signs of uneasiness but required little treatment. There would appear to be too great a tendency on the part of some owners to be continually dosing their horses with all kinds of concoctions on the slightest provocation. I am confident that in many cases the animals would derive more benefit if they received less medicine and a more liberal supply of good food.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—No cases exist in my District.

Scab.—Only a single outbreak has occurred during the month. This case is in Utrecht Division.

Glanders.—I am sorry to have had to report another case of this disease at Dundee. This horse showed clinical symptoms, and the animal had evidently been affected with the disease for some considerable time before the clinical symptoms made their appearance, as the owner informed me that the animal had been subject to a chronic cough for several months past. Fortunately this was the only horse kept on the premises. It is therefore possible that the infection may not have spread any further from this case.

A further number of thirteen animals had to be tested with mallein in consequence of a case occurring in a horse a few days after his arrival from Pretoria at Dundee. So far as I can ascertain, this case did not show any suspicious symptoms until it suddenly commenced to bleed from the nostril, when the owner, becoming alarmed at the hemorrhage, consulted a veterinary surgeon, who certified the case to be Glanders. I do not antici-

pate much further trouble with the disease in my district. It is possible that a few more isolated cases may occur, but the majority of horse-owners are now somewhat acquainted with the symptoms, and have become aware of the fact that it is greatly in their own interest to report anything of a suspicious nature as quickly as possible to enable them to secure compensation for infected animals before clinical symptoms make their appearance.

IXOPO.—D.V.S. POWER.

Lungsickness.—An outbreak of this disease was reported amongst transport oxen belonging to a Basuto in the Polela Division during the early part of the month. Two oxen showing suspicious symptoms were killed, and on *post mortem* pronounced "Lungsickness" virus was taken, and with it the remainder of the span inoculated. There appears to be some doubt as to whether the case was really one of Lungsickness. I did not see the sick animals as they were killed by the owner, and when I arrived at Bulwer on the 9th inst. no further cases had occurred. However, as the owner was satisfied that it was Lungsickness, the farm was placed in quarantine, as were also the in-contact cattle. To date no further cases have occurred.

Redwater.—As far as I am aware no cases of this disease occurred during the month.

Glanders.—None.

Mange.—A few cases of this disease have occurred amongst Kafir horses, but the natives are more inclined to apply dressings this year than they were last.

HOWICK.—D.V.S. WEBB.

Redwater Inoculation.—I see in the *Agricultural Journal* of June 12th an article written by Mr. L. D. Gilson on Redwater Inoculation. An experiment which I carried out some three years ago at the instigation of a Natal farmer may prove of interest to him, and others who devote attention to this subject.

The idea was to immunise an imported Devon bull, aged about two years, against

Redwater. A heifer which had recovered from a bad attack of the disease some considerable time previously was obtained. From this animal two yearling Colonial-bred bulls were inoculated with 5 c.c. defibrinated blood. A very slight temperature reaction was the result, no visible signs of sickness were noticed. About a month after the experiment I took 10 c.c. defibrinated blood from one of our Colonial bulls, and subcutaneously injected it into the imported bull. As far as I can remember, there was no reaction until the twelfth day, after which a virulent attack of Redwater developed, to which the bull succumbed, after an illness of about three weeks. From this it will be seen that there is considerable danger when the subject is an imported beast. I believe it would be a matter of not much difficulty to obtain a reliable vaccine for the partially immune Colonial cattle, but as Mr. Pitchford, in his comments on the before-mentioned article, says, "the treatment of European stock becomes a more serious matter." Although, even with these cattle, if the experiments about which I remember reading in a Cape journal, are correct, the difficulty might be overcome. These experiments were carried out, I believe, by a Dr. Hunt, and the conclusions arrived at were that a large dose of blood taken from a recovered Redwater beast gives less reaction when inoculated into a susceptible animal than a small dose, and the reason given for this phenomenon was that the blood of a beast which had recovered from Redwater contained a powerful anti-toxin which was *not* anti-microbial, and, as a consequence, on the introduction of a large quantity of the blood from a salted beast into a susceptible one, the large amount of anti-toxin present in this blood quickly neutralises the toxic substances manufactured by the organisms introduced at the same time, and which would commence to multiply in the fresh soil, whereas when a small dose is injected the toxin elaborated by the micro-organisms has full play, there being insufficient antagonising material to overcome the continuous manufacture of poison produced by the quickly developing parasites. The experimenter suggests that there is probably a limit to

this reproduction, and this limit, when a great number of organisms are introduced, is quickly arrived at, and their toxin is soon overcome by the large quantity of anti-toxin introduced with them. On the other hand, when a small quantity of the blood is injected the organisms multiply with great rapidity until they reach the limit, and their toxin soon becomes in excess and able to smother the slight antagonising effect of the small quantity of anti-toxin. The limit to the reproduction of organisms is probably determined by the quantities of toxin they produce, rendering the blood unfit for their further development.

If these experiments are reliable it would appear advisable when inoculating imported European cattle to inject a large dose; I know it is pretty fatal to inject a small one if the inoculated blood is at all virulent, and the subject two years old or upwards, so I should, if I am ever called on to carry out another experiment, commence with a dose of 100 c.c. and try what effect that would have.

MARITZBURG.—D.V.S. FYRTH.

Scab.—There have been no cases in the City or Umgeni Divisions during the month. The prosecution of Mr. J. Vanderplank for contravention of the Scab Law resulted in a fine of £7 10s. being imposed. This, I trust, will have a salutary effect on offenders under the Law.

Lungsickness.—No cases have occurred in any of the three Divisions.

Glanders.—No cases during the month of June.

General.—Four cases of snake bite in cattle occurred during the month, of which two oxen died, and two recovered, after injection of the surrounding tissues with a solution of permanganate of potash.

A native was proceeded against during the month for contravening the Scab Law, and was fined £2.

Several cattle belonging to a native were reported as having died, and an examination and investigation revealed death to be due to Quarter-evil.

There has been very little illness among stock generally.

Two cases of paralysis have been brought to my notice. One, that of a mare, had been getting worse for months, and at last total and complete paralysis occurred, and as the case was not amenable to treatment, the animal was destroyed. The other case, a cow, was noticed to be "rocky" behind when walking, and getting worse, was treated by me at the request of the owner. A dose of Epsom Salts (2 lbs.) was followed by doses of Pulv Nucis Vom, 2 drams, and Ammon Carb, $\frac{1}{2}$ oz., in a suitable medium once daily, and gradual recovery took place.

VERULAM.—D.V.S. SILARPE.

Lungsickness.—There is an outbreak of this disease in the Indwedwe Division among a herd of 26 mixed native cattle. This outbreak was traced to an old "lunger" which had been at the kraal for over two years. They are now under license, six have been destroyed, and the rest inoculated.

Glanders.—On the 4th I shot one horse suffering from this disease, and tested two in-contact ones, neither of which reacted. On the 23rd I was wired for to see a sick mule, and found it bad with Glanders, so had it destroyed. This was among a stable of about 160, so I had them quarantined to the estate.

Rinderpest.—This disease in Zululand seems to be gradually receding from the river; we have a strict guard this side still.

Quarter-evil.—There have been 12 cases of this disease this month in the Lower Tugela and Mapumulo Divisions.

General.—Stock on the whole continue very healthy.

ZULULAND.—D.V.S. TYLER.

Rinderpest.—Very little change has taken place in the state of this disease during June. The Eshowe District is affected to a much greater extent than any other. The disease has again broken out at Itala in the Nkandhla District, having been taken there by transport cattle; the Natives refuse to have any-

thing to do with inoculation. In the Mahlabatini District there has been a slight increase, but the disease has not assumed larger proportions than could be easily dealt with had we the power to compel inoculation. There has been, I regret to report, a fresh outbreak in Ndwandwe District, in the ward of Chief Usibepu. I do not think, however, that we shall have much trouble in dealing with this centre.

Lungsickness.—One fresh license has been issued in the Ndwandwe District.

Gallsickness.—One or two cases of this disease have been reported, but cases are not so common in Zululand as in some parts of Natal; perhaps it is that owing to the sparse European population they do not come under notice so easily.

Glanders and Horsesickness.—Nil.

Tick Fever.—Three kraals have manifested symptoms of this disease, but they are fairly close together, and about two miles from the original outbreak. A competent man has been sent to Ingwavuma to take charge of the outbreak, also a supply of drugs, dip, and spray pumps. The whole of the in-contact cattle, and also those infected, will be sprayed and the greatest care taken to keep them free from ticks. Owing to the grass being too green it is impossible to destroy the infected veld to the extent which we desire, but this will be done as the opportunity presents itself, and every other means taken to destroy the infection.

LADYSMITH.—D.V.S. O'NEIL.

This month has been notable for the number of prosecutions that have taken place among Indians and natives for contravening the Stock Disease Laws of the Colony. I have visited all the Divisions of my District except Umsinga, where I was unable to go to owing to the pressure of office work; but trust to spend some time up there during the ensuing month. The stock near the Berg are in fair condition, taking into consideration the severity of the weather during the month. The native stock are in good condition.

and look healthy throughout the district irrespective of the bare state of the veld.

Lungsickness.—No fresh cases have been reported during the month.

Scab.—Eight flocks have been put under license, and are being attended to by the owners.

Glanders.—Nothing to report.

Rinderpest at present does not exist in this district.

Stijva Ziekte.—I visited two cases in milch cows at Wessels Nek and prescribed for them, and up to the present they are still surviving.

Redwater is responsible for the loss of three head of cattle in the Umsinga Division, and the one case that occurred in the Klip River Division recovered under treatment, having been unable to get up.

Gallsickness has carried off five head in the Umsinga Division, where the disease has considerably abated.

Quarter-evil has carried off three head of stock, and the owners are inoculating against the disease at Umsinga.

VRYHEID.—D.V.S. CROLE.

Rinderpest, which we had some hope was dying out here, still smoulders on. The Pongola Valley had been free of it for many weeks till an outbreak occurred on the Pivaan, evidently brought there from the Paulpietersburg infected area across the river. The Denny Dalton outbreak, though still active, has yet been kept circumscribed. All the outbreaks are amongst Natives' cattle, and such epidemics are always the most difficult to deal with satisfactorily under the existing laws.

Equine Mange is very prevalent.

Lungsickness is the disease that gives most trouble. Eight herds are now under license in the Vryheid District, and two in Paulpietersburg.

Scab.—Five flocks are now under license here, and one at Paulpietersburg.

Quarter-evil.—One case has been reported, the first during nine months.

The general condition of stock in these districts I consider to be satisfactory when all the circumstances are considered.

Judging at Shows.

LETTERS TO THE EDITOR.

DEAR SIR.—I have read with the keenest interest the letters published in the last issue of the *Journal* from the various Judges at the Maritzburg Show; and I think the *Journal* is to be commended for inviting a discussion on the subject, as the benefit to be derived from such a discussion is unquestionable.

With one exception, I agree with most of the views set forth in all the letters; there are a few points, however, which lay themselves open to friendly criticism.

I cannot agree with Mr. Dick in his supposition that exhibitors, as a rule, fancy their geese swans. I think he will allow that a man who owns stock or produce fit for exhibition is, at least, something of a judge of what is required; and it is only when he fails to see the superior merit in the animal which has beaten his exhibit in any particular class that he feels dissatisfied.

Judges are certainly deserving of the thanks of all classes of the public, but not more so in my opinion than all the other officials connected, directly or indirectly, with the show, who also do their best to make the show a success.

The object of appointing Judges from some remote district is no doubt to avoid getting a man to judge stock that he may be intimately—as it were—acquainted with, and not only the stock, but also the owner. But I question if the object would be attained by such a practice being carried out, unless our shows were restricted to local exhibitors only, which, of course, would be highly undesirable. When open competition is invited and availed of, the same exhibits are seen practically all over the colony; and most Judges would remember the animals they had passed judgment on for the rest of the season at least. Besides the appoint-

ment of an outsider might be considered a slur on the intelligence of the District to which the show belongs. A man who is influenced by party feeling is no judge, and the sooner he ceased to act as such the better for all concerned. Besides, a Judge who has an opportunity of judging his neighbours' stock gives his neighbours an opportunity of judging him; he has then a chance of defending himself by giving the reason of his awards, which would obviously be a means of carrying out the object of this discussion.

Any member of a society's committee who nominates a friend as a Judge would certainly not be acting by his friend as he should do, unless he was fully convinced of his friend's competence; and the friend would be a bold man to accept the office under the One Judge System, unless he was satisfied in his own mind that he was capable of giving satisfactory judgment, knowing, as he should do, that his reputation was at stake.

I am afraid that Mr. Dick would find the formation of an Association of Judges of Stock and Produce rather a difficult undertaking. However, if Mr. Dick would kindly publish in the *Journal* his views on the formation and proper working of an Association of this kind, I am sure the readers of the *Journal* will be grateful to him.

The employment of expert Judges from abroad should be the duty of the premier Agricultural Society; and these Judges should receive payment for their services, and the Government should have no say in their appointment. They should furnish the secretary of the society with a report of the merits and demerits of the classes which have come under their judgment, which the committee should have published for the benefit of the public in general and exhibitors in particular. The employment of experts from abroad by the premier society would act more as a court of appeal for the smaller societies than would be the case if they also engaged expert Judges. Besides, the smaller societies are not in a position financially to pay for the advice of experts.

Sir T. K. Murray's quotation from one of our astute Judges is no credit to that gentleman—or perhaps it was a lady? Anyone who is not able to give the reason of his decision without coming to

grief should not undertake the responsibility of judging.

By "general public," I conclude Mr. W. T. Woods means that section of the public who do not take an active interest in agriculture. To those who do, however, the points of an animal are more or less evident; and when we notice these points overlooked without the successful exhibit showing any compensating advantages, we are apt to wonder why, and also to lose faith in the Judge. No doubt the Judge has his reason for the award, but those keenly interested would also like a knowledge of the reason.

Mr. Theodore Woods might have also mentioned in his rather humorous conclusion, that a pig, in addition to being carried to and fro gratis, is also provided with a—to him—luxurious bed by the society. Whereas Stewards, as well as Judges, have to pay the hotel proprietor for what they don't get in the shape of beds. I do not wish to suggest for a moment that Judges or Stewards should have their hotel expenses paid, but the society should at least see that they are provided with those comforts. It is all very well for the hotel proprietor to tell you that you will be "quite comfortable" with your head propped up on an arm-chair and your feet on an empty soap box, with a current of cold winter air to fill up the space in between, but it has to be tried to be appreciated.

I am &c.,

Mooi River, CHAS. R. SKOTTOWE,
30th July, 1903.

DEAR SIR,—I was present when Mr. Challis made the remarks referred to in the article on "Judging at Shows." These remarks struck me as a new departure, which generally I agreed with. You are, I have no doubt, aware that at our premier show the Judges are specially requested to give no reasons. This, I suppose, is to check disputes, on the principle of the advice given by an old Judge to a young man going to India: "Give your decisions, but give no reasons; your decisions will probably be right, your reasons wrong."

My opinion is that a crowd round a Judge asking questions, and getting

reasons while the actual judging is in process, would be apt to confuse all but the oldest and coolest of Judges. What I would propose is that Judges be allowed peace to give their awards, but once that is done, that they put themselves at the disposal of the public to explain the reason of their awards.

The following are the points I go by in judging :—(1) Type. (2) Symmetry. (3) Condition. (4) Money value. I lay considerable stress on condition, having in many cases refused prizes on account of bad condition. I cannot see that it is right to give prizes to those who by their neglect are deteriorating the cattle of the country.

As our shows are carried on the Judges have generally as much as they can do before lunch time in making their awards; I would therefore propose that they be asked to attend, say from two to three, to give their reasons, and answer any questions put to them. I quite agree that our show yards should be educational, and that there are always some who wish to learn.

There is one point I would like to draw attention to, and that is, if our shows are to be educational, there must be greater care in the classification of animals. I have often seen the public greatly puzzled, and known hard things to be said of the Judges, because the finest animal was passed over without a prize, the Judges seeing at once that the animal was in its wrong class. I have seen many cases, and several of them at recent shows.

The most striking case I remember was that of a very fine imported cow which had been placed amongst grade cattle; the owner was very indignant that a prize-winner in her native country should be passed over, and inferior grade cattle put before her. I am not sure that he or the public ever understood that the Judges would not disgrace the cow by calling her a grade animal. What is wanted is some authority to remove such animals from the class, and allow the public to see really what cattle have been compared.

Yours truly,

JAMES SCOTT,
Judge Maritzburg Show, 1903.

Impolweni, July, 1903.

DEAR SIR,—With respect to the subject of "Open Judging at Shows." I regret I am unable to suggest anything in the matter. I am not in the habit of judging, and do not care about it. Doubtless you will find many who have had experience in judging to give you their views on the subject.

I much regret I have unavoidably been prevented answering your letter before this.

Yours faithfully,

W. P. GIBSON,
Judge, Maritzburg Show, 1903.

Howard Hill,
Byrne.

Dipping Tanks.

IN the last issue we stated that the Interview with Mr. Geo. D. Alexander would be published. That intimation has brought the subjoined letter from Mr. Alexander. Acting upon the suggestion to invite the expression of opinions of those who have already erected dipping tanks a circular letter was sent to the gentlemen he names. Unfortunately the response is meagre—due in all probability to the distaste to writing characteristic of farmers throughout the

world. Happily, however, the localities of those who have tanks are well dispersed, and for many of our readers there will be but little trouble in getting the opinions on dipping at first hand from the owners of the tanks. From personal knowledge we may state that the opinions of several, who are not writing, as to the value of dipping are of the highest :—

DEAR SIR,—I note from the last issue of the Journal, that you intend to re-

publish my remarks on the dipping of cattle, for the information of readers.

I would suggest that you obtain the opinions of others who have erected and used dipping tanks, as, I think, judging from the experience at Nels Rust, that you would obtain expressions of satisfaction from all who have used the method. Amongst those of whose experience you might invite expression are:—Mr. G. McKenzie, of Buccleugh; Mr. P. Otto, of Riet Vlei; Mr. G. Armstrong, M.L.A.; Mr. H. Walker, Highflats; The Hon. T. Hyslop, Colonial Treasurer; Mr. T. Morton and Mr. Clarke, Howick. Most of these gentlemen have dipped neighbours' cattle in their tanks, and might, if asked, obtain opinions from those who have used the tanks, and the valuable evidence, as to the advantages of dipping, which I think you could obtain, might induce many to adopt what is, I consider, the greatest boon that has ever been brought to the notice of stock farmers in Natal.

In closing I wish to say that I do not agree with Mr. Otto's suggestion to do away with the sudden drop of 5 ft. 6 ins. at the end of the slide in, and have instead a continuous slope, and have a Kafir to dip the animals, with a forked stick. The sudden drop at the end of the slide in is, I think, absolutely necessary, and even with this drop in some cattle escape immersion of the head, and it would be impossible for a native or anyone else to force the heads of all cattle under by means of a forked stick.

I think, perhaps, that on further consideration, Mr. Otto may alter his views on this point. However, it would be valuable for those intending to erect dips, if you called for expressions of opinion on this point from others who have used the dipping tanks.—I remain, yours faithfully,

GEORGE D. ALEXANDER,

Meyers Hoek,
30th July, 1903.

DEAR SIR,—In reply to yours of the 1st inst., I have much pleasure in testifying to the great benefit derived from the

use of a dipping tank for cattle and horses as a means of freeing them from ticks, or mange.

I have never had my stock look or do better, and now often wonder how I ever managed to get along without a tank.

I should much like to see dipping made compulsory throughout the Colony, as I feel sure it would be the means of eradicating the ticks, which is one of our greatest evils.

In conclusion, I would advise farmers to club together and build tanks—a measure they will never regret.—Yours faithfully,

P. OTTO, J.P.

Saxony, 3rd August, 1903.

DEAR SIR,—In reply to your request re Dipping Tanks for Cattle:—Four of us erected a tank in a central position. The plans and all necessary information were kindly supplied by Mr. D. Alexander, of Nel's Rust, and my cattle were all dipped three times before winter set in, and I notice a marked improvement in their condition this winter, compared to that of last winter, even although my cattle have passed through a very trying season owing to scarcity of grass.

I am well pleased with the result and hope soon to see dipping-tanks for cattle and horses general throughout the Colony. Where a few farmers club together the cost is but small compared to the benefit their stock derives.—Yours truly,

THOMAS MOERTON.

Ashley, Howick Rail,
3rd August, 1903.

CATTLE DIPPING AT NEL'S RUST

BY ERGATES.

(Reprinted from "Agricultural Journal"
No. 8. Vol. V.)

ABOUT three weeks ago there was a cattle-dipping at Nel's Rust, and Mr. Geo. D. Alexander was good enough to invite me to witness the interesting operation. Through pressure of time I was not then able to glean all the information I desired. Accordingly, by arrangement, I met Mr. Alexander last week, and he most fully supplied me with what I wanted in every respect.

Mr. Joseph Baynes, M.L.A., the owner of Nel's Rust, whose enterprise as a farmer is known to every colonist, is at present on a visit to England.

PLAN OF THE DIP.

The first thing necessary was the plan. This he drew for me in detail. It gives the surface view of the yard, the race, the tank, and the dripping-yard. There are also longitudinal and cross-sections of the tank, a cross-section of the boiling apparatus, designs of the sliding gates, etc. The whole plan is now in the office of the Surveyor-General, where it is being prepared for the reproducing process; as early as possible it will appear in the "Journal" as a supplement.

On my beginning to put questions, Mr. Alexander said:- "I think I can save you a lot of trouble. I have been asked for exactly the information you want by the Governments of the Cape Colony and Rhodesia, and here is a copy of the report I wrote yesterday."

The document, which follows, will be found to be of much interest:-

REPORT ON THE DIPPING OF CATTLE FOR THE DESTRUCTION OF TICKS ON THE NEL'S RUST ESTATE.

A dipping tank was erected on the estate. It was started at the beginning of January, and completed about the end of February, and has been in use since then. It has been an unqualified success, and as ticks have been exceedingly plentiful here this season, I do not know how we would have succeeded (if we had not had the dip) in keeping the stock clear of ticks. The cattle would certainly not have been in the condition they now are, and we would have in all probability lost a number of cattle from the effects of tick infection. There is no question about the efficiency of the dipping; no matter how heavily the cattle are infected, it absolutely clears the ticks off, and, further, it removes all the scurf and dirt from the coats, and after one or two dippings the coats lose all the scurf and dirt, and have quite a different appearance.

I think the dip would also be successful in destroying mange in horses. I intend to dip horses for ticks, as well as the cattle.

When cattle badly infected with ticks are first dipped, for a day or two they seem to feel the effects, and are rather stiff and sore, the cows also go off their milk for a couple of days, but this

effect speedily disappears, and in after dippings (if the cattle are not allowed to get grossly tick infected), the cattle do not seem to be affected in any way, except by the removal of the ticks, which, needless to say, is a good effect.

Cows heavy in calf can be dipped. I have dipped cows within two days of calving.

The reason why the first dipping of grossly infected cattle is somewhat severe, is that the unfortunate animals are a mass of open wounds, caused by the tick bites, and the dip makes the wounds smart, just as, say, if one's arm, scratched in a barbed wire fence, was plunged into a bucket of brine, it would cause no little pain, whereas if the arm was unscratched, it could be plunged with impunity into the brine.

I am of opinion that the use of the dip will enable us to carry three or four times the number of stock on this estate, and that the stock will thrive much better. Hitherto the number of stock we could run was limited in number to the extent of those we could keep moderately free from ticks.

For many years we have tried to deal with this tick question, but never successfully until now. What is called the Douglas method in the Cape, was tried some two years here before it was brought out with a flourish at the Cape. I refer to the use of paraffin sprayed on to the cattle with a spray pump; this was tried with paraffin only, and with an emulsion made of paraffin and soap. It removed some ticks, but the effects were evanescent, and the cattle a day or two after were as badly affected as ever; it was also very expensive.

It would take too long to enumerate the different things we have tried, and without success. We sent to America for a special oil they have been dipping with there, intending to use this, when the dip we are now using was brought to our notice.

The great advantage of the dip in use is that it keeps the cattle clean for three weeks to a month in the season, when the ticks are worse, and I should say, judging from the cattle we have running on the high lands, where the ticks are not so plentiful, that six weeks to two months between dipping would suffice in districts where tick infection is not so great as here. I think also that, in time, we shall be able to clear the estate of almost all the ticks.

The importance of keeping cattle clear of ticks cannot, I think, be over-estimated. There is little doubt that Red-water, or Tick Fever, as it is called in

Australia, and "Texas Fever" in America, is conveyed by the tick, in the same way as nagana is conveyed by the tsetse fly, and malaria by the mosquito; and, unless something is done to control the spread of ticks, I should not be surprised to see a wave of Redwater pass over the country, especially over those districts which up till now have been fairly free from "ticks."

I think that the mysterious disease we hear of in Rhodesia will turn out to be Redwater in a virulent form. I heard that calves had been dying in Weenen County this season from Redwater. I am certain that in the majority of cases of so-called "Gallsickness," that the animals die of Redwater, in a form in which the urine is not discoloured by blood. I do not think there is any specific disease of Gallsickness.

Such cases as are not Redwater mostly arise from digestive trouble, and yield to treatment in that direction. I have no doubt this theory will be derided by "the experienced transport-rider" and the "Old Colonist," who are, as we know, considered by many to be infallible. If I am correct in this, it will be seen how vitally important it is that the tick question should be considered, and an effort made to check the spread.

Mr. Haynes has repeatedly urged the necessity of something being done to check Redwater and the tick plague. Apathy amongst farmers is the chief cause that nothing has been done. If they had seen the matter in the light we did, they would have insisted on something being done years ago, and it would have saved thousands of stock.

We know that calves do not thrive in this district during the months of December, January, February, and March, and I think it will be found that this is mainly owing to tick infection from small ticks. I intend to experiment in this direction during the coming summer months, by dipping the young calves, and leaving a few undipped, and compare results.

At the request of the Principal Veterinary Surgeons of Cape Colony and Natal, I have supplied them with full information, and understand the Governments of these colonies intend to proceed with the erection of dipping tanks without delay.

NOTES ON DIPPING.

Formula:—

6 lb. Arsenic.
24 lb. Soap (common yellow).

24 lb. Washing Soda Crystals.

5 galls. Stockholm Archangel Tar.
400 galls. Water.

The dip must be boiled for six hours to ensure chemical mixture.

For heating purposes, two 400 gallon tanks are used here. Fill only 300 gallons into each tank, and add 100 gallons to each tank after dip has been boiling for 5½ hours. If the tanks are filled to start with, the dip will boil over, causing considerable wastage.

It is essential that the whole of the dip should be boiled, i.e., it will not do to put all the ingredients into, say, one 400 gallon tank, and then to dilute this with water. This was tried in Australia, and was not successful. It takes about 3,500 gallons to fill the tank.

The dip should be used at a temperature of about 100 degrees, the dipping tank should be covered, and arrangements made so that no water can get into it. The dip can be used over and over again, fresh dip being added to make up the quantity removed by the cattle, which is, roughly, rather less than a gallon per beast.

Cattle grossly infected with ticks may feel the effects of first dipping rather severely, and a favourable day should be chosen to dip, the reason being the cattle are so raw from tick infection, and the arsenic, etc., is taken into the system to a certain degree, and the nipping sensation of the dip will make them feel seedy for a day or two.

It will be found that milk cows will go off their milk for a day or two, but after that the milk flow will exceed the quantity prior to dipping. The ticks will not fall off until four or five days after the dipping, the result being apparently disappointing on the day following dipping, as the ticks seem to be as numerous as ever, but, on examination, they will be found to be dying or dead, and will relax their hold on the animals about the fourth or fifth day.

Cows heavy in calf and young calves may be dipped with impunity, also thin cattle. In dipping calves, however, it is advisable to put a head-stall on the calf, and, after the first plunge, keep the head out of the water, otherwise they may sink two or three times, and swallow too much of the dip. The writer lost two calves owing to this.

GEORGE D. ALEXANDER.

June 9th, 1902.

SUPPLEMENTARY.

Having read the report, I asked Mr. Alexander a few questions which its perusal had suggested.

"What do you think of the Queensland dip, published in a recent issue of the 'Journal'?"

"I don't think the proportions as good as ours, and I think it is a mistake, unless there is some real compensation, to recommend to farmers ingredients in the getting of which they may have difficulty. Every farmer knows where to get Stockholm tar, common soap, and washing soda, and the arsenic, as locust destroyers know, can be got from Messrs. Turner, chemists, Maritzburg. Possibly there are also other chemists who stock it in quantity."

"What is the value of a tankful of dip?"

"Let us work it out from the invoices:

40 galls. of Stockholm Tar	£3 4 0
192 lb. Washing Soda	0 19 9
192 lb. Yellow Soap	2 10 6
48 lb. Arsenic	0 15 6
	£7 9 9

Those are Maritzburg prices."

"What does the price come to per head?"

"The mixture, with its 3200 gallons of water, comes to a little less than 3d per gallon; a beast takes nearly a gallon away in its hair, and consequently the actual cost per head for materials for making dip comes to a little under a half-penny. Of course, this does not include cost of fuel for boiling dip, and labour, interest on outlay, etc."

"When a dipping is ended, is the tank cleared out?"

"No. For the next dipping more is added to what remains."

"Is there any danger of the arsenic precipitating, and the residue becoming stronger than the formula?"

"None whatever. The mixture is a chemical one, not a mechanical one, as with some of the sheep dips in the market, which require constant stirring."

"How many beasts have you dipped, that is to say, how many passages through the tank have there been?"

"Over 4,100."

"And deaths immediate or attributable to the operation?"

"Two: both calves. They drank too much; calves do not go through so well as fully-grown animals. They are inclined sometimes to turn round and swim back to the starting point, when, of course, there is the danger of meeting another going ahead. If two meet in that manner, the head of one of them is likely to get some longish duckings, during which time more of the dip than is good for the youngster is apt to be swallowed. By putting a head-stall on the calf's head for holding it up after

the first submersion, and guiding the animal through the bath, all the small risk can be avoided."

"How many beasts can you dip per hour?"

"If they go freely, about 100. If they are obstinate or very tame, fewer will be done. Odd animals among our quiet tick oxen and very quiet cows, as you saw at the recent dipping, are the most troublesome; it is difficult to frighten them forward. Wild cattle are done the quickest. They follow in a continuous string. With them it is necessary to be on the alert at the gate to prevent one animal jumping on the top of another."

These observations bore out what I saw at the dipping referred to. The tamer the beast, the more difficult it was, as a rule, to get it forward. Some of the very tame ones, however, appeared as inclined for the bath as spaniels are for a swim. Mr Alexander, at the dipping I witnessed, said that probably he would put a windlass on the supports of the roof of the bath, in order to facilitate the dragging in of particularly obstinate beasts. When what remains of the Queensland importation were entered for dipping, the rate of progression was immensely accelerated. They were all in a hurry. Two or three would be in the tank at the same time, and the noise from the plunging reverberating between the wings and the roof was like that of billows breaking on rocks. I asked:—

"Is the dip fatal to the ticks; do any survive the bath?"

"None. You know what a large number of dips have been tried in America and Australia, and abandoned owing to the injury they did to the cattle, or to their inefficacy in destroying the ticks. The dip used here completely kills the ticks, and instead of having an injurious effect on a beast's skin, it really improves it. By the bye, we tried practically this very same dip five years ago, but without boiling sufficiently. The effects were so bad on the skins of the beasts, so scorching, that we gave it up. I mention this as a warning from our own practical experience for the benefit of those who think they will be able to dispense with that operation."

"You speak strongly in your report about the number of cases of redwater that are mistaken for gall-sickness."

"Yes, I do. I hold that fully 50 per cent. of the deaths reported to be from 'gall-sickness,' or what the kafirs may call 'bushziekte' or 'kouhlane,' are in reality redwater cases; and I have had seventeen years' experience among cattle in the colony, transport and

breeding, besides having had a large number of imported animals under my observation. I do not think there is any specific disease which can be called gall-sickness. The so-called "gall-sickness" takes the place amongst cattle diseases of the "any other variety" class at an agricultural show. If a beast dies and it does not show the recognised signs of lung-sickness, redwater, anthrax, or rinderpest, it is classed as "gall-sick." Some cases thus classed arise from temporary disorganisation of the digestive organs, and these cases yield to a smart purge and tonics, but many cases of the so-called "gall-sickness" are really cases of redwater. A superficial post mortem examination of a beast which has died from redwater will, as a rule, show an enlarged or discoloured gall, but that comes merely from an arrest of the digestive functions. A more thorough examination, including microscopic examination of the blood, would show the disease to be nothing else than redwater. Of course, there are many who cannot believe that an animal dies from redwater, if the water it passes is not discoloured. The disease cannot be diagnosed solely by the pressure of blood in the urine, especially in those localities, such as this, where the disease is endemic, and the blood in the urine symptom is rare."

"You attribute the heavy mortality among summer calves in this district to ticks?"

"I do; largely. The calves get infested with multitudes of ticks: irritation is the consequence, they are constantly licking themselves; indigestion follows, and in some cases hairball; they become unthrifty, and despite the

certain amount of immunity they acquire from the tick inoculation, their debilitated condition renders some of them easy victims to the disease. I think, however, that calves born in this district have a certain amount of hereditary immunity from redwater."

"You expect to get rid of ticks altogether?"

"Yes; in America and Australia dipping has produced clean areas in tick country, and why not here? When those conditions arrive, the interest in the long and short hair breeds will come to an end, and shorthorns, with their long hair, will be at no disadvantage."

"What did the dipping plant, the tank, boiler, and yards, all complete, cost?"

"I have worked it out at £120, including masonry, bricks, cement (12 barrels), labour, and poles, all at market prices. In a great many instances farmers could combine, and, of course, the greater the combination, the less the individual outlay. Again, a man might put up the plant where there would be a demand for its services, and do dipping for the neighbourhood at so much per head.

I tried to think of more questions, but failed. On telling this to Mr. Alexander, he said:—"But there are others who will think of other questions, and I shall be obliged if you will state that, much as I should like to, it will be impossible for me, owing to the amount of work I have now in hand, to reply to enquirers individually. If, however, they will write to the "Journal," I shall comprehensively answer them to the best of my ability."

The Thoroughbred as a Sire.

IN the last issue we published, at the request of a correspondent, an article from the *Live Stock Journal*, lauding the Hackney. In the opinion of another correspondent the effect which that article may have had requires correcting, and for that purpose he sends the following, which is taken from the last issue of the *Cape Agricultural Journal*. Our correspondent says he agrees thoroughly; misfits, he contends, are too frequent. The following is the article:—

When it has been for ages acknowledged that England has obtained universal and unrivalled celebrity for a breed of horses; when we find enormous prices are given for various kinds of British farming stock—whether it be Shorthorns, sheep, pigs or poultry—and an assertion is made that the character of the British horse has fallen from its high estate to such an extent that we cannot find sufficient efficient animals to supply our cavalry, two things suggest themselves: (1) That atten-

tion has been paid to advancement in agriculture at the expense of horse-breeding, (2) or that our troops are insufficiently mounted owing to the fact that the natural sources from which the supply of remounts should be obtained is neglected and undeveloped.

That the British Islands and their dependencies have been drained of horseflesh during the past war is true, and with the diminution of their numbers their value has increased, and they are sought for by foreign dealers at high prices, which would not be the case if they were inferior to those of other countries.

Any person who will take the trouble to examine the horses upon which our troops are mounted must return convinced that taken as a body they are by no means defective, and if I might suggest to remount buyers the most effective means by which that class of horse could be improved, one of these measures would be by increasing the regulation price. If any man conceives that a good horse cannot be bought at any price he labours under a great mistake. As the race-horse has originated from the Arabian (or some other foreign blood), it is argued that we require (in this country) a fresh infusion of that blood.

For racing, such an admixture is known to be worthless, and for general purposes, the majority of Arabians cannot be recommended. They are short, mostly defective in their shoulders, and more fit for show than use; neither would they produce animals calculated to carry any weight.

The partisans of these animals affirm that in India they undergo vast fatigue and are gifted with great endurance, but they do not possess these qualifications here when opposed to even third-class animals of our own breed.

If any man to-day were to make a similar match to that of the famous Mr Osbaldiston, to ride 200 miles in a given time, he would not select Arabs for the performance. It will be remembered that "Tranby" on that occasion carried the Squire sixteen miles, divided in four four mile heats in 33 minutes 15 sec-

onds, which no Arabian horse that ever appeared out of Arabia could have done, and I have heard men of experience in horse-breeding in India say that the best results were obtained from the English stallion and native mares.

Nevertheless, for breeding fancy riding-horses (park hacks), &c., in which show and appearance are the main objects, very handsome mares might be selected, with good shoulders not oversized, but as to their being the means of increasing the stamina or powers of either the English or Colonial horse, it is quite out of the question. If it could be substantiated as an argument, that resorting to the primitive would improve the breed of any class of our domestic animals, it would be an avowal that the primitive stock was superior to that which has been cultivated for ages. The fox hound is said to have originated from the sheep dog—an opinion which I am not prepared to endorse—but would any master of hounds select such an infusion for the improvement of his pack?

Without resorting to the Arabian or any other foreign strain, we possess plenty of blood without any incestuous admixture, and although the custom of breeding in and in is resorted to by breeders of Shorthorns to a surprising extent, it cannot be sanctioned in breeding horses, or in fact any animal in which powers of endurance and activity are essential, and I think that as a judiciously mated sire—I repeat judiciously mated—there is none to touch the English thoroughbred, and let any cross you want to be on the side of your dam.

It is sheer delusion to suppose that blood is necessarily opposed to power. Doubtless they are weeds amongst thoroughbred horses—bad examples of a noble race—but to know the thoroughbred well and intimately, is not only invaluable to the breeder, but indispensable to him if he wishes his success to rise above mediocrity.

At the outset the prejudice must be dismissed which represents him as a slight weedy animal, useless away from the turf except as a fancy hack or lady's

riding horse, and it is a fact worthy the attention of breeders that a considerable proportion of the most successful race-horses have been animals of great power, to mention four examples, "Melbourne," "Lanercost," "Sir Tatton Sykes" and "Van Tromp." The first is the sire of an Oaks winner, two Derby winners, and two St. Leger winners. Lanercost is the sire of a St. Leger winner and an Oaks winner. Van Tromp his son, won the Champagne Stakes, the St. Leger and the Emperor's Vase. Sir Tatton Sykes won the St. Leger.

These are four horses of first-rate reputation, the two first as sires of winners and the two last as winners themselves, any one of which would, as a hunter, have been strong enough to carry fifteen stone across country. Animals like these, though too valuable to put, save in exceptional cases, to any but thoroughbred mares, would, out of working mares, produce the best cart horses.

I have seen horses in a coaching team, got by thoroughbreds of note from working mares, who in style, stamp and pulling powers far outstripped their mates got by lower bred sires. It may be said that such instances do not often occur. In one sense they certainly do not, for unfortunately good working mares are rarely put to "first-rate" thoroughbred horses, but if they were, the produce would probably exhibit as great a uniformity of excellence as the breeder often attains. Let any one who has an opportunity, study, point by point, the winner of one of the great English races, if he wishes to look on a combination of symmetry, power and beauty, of which the animal kingdom affords no other example.

It is possible that the beginner who looks for the first time at such a horse, may be disappointed and wonder at his fame; let him be assured that the deficiency is not with the horse, but in his own unpractised perception.

While upholding the general utility of the thoroughbred as a sire, it must not be imagined that the first enquiry in looking at a probable sire should be "How is he bred?" Some men seem

to think this the golden rule whereby to judge man, horse, or hound. It is quite true that some of the veriest weeds, sold for a ten pound note, could boast a lineage of unspotted purity in direct descent from the Darnley Arabian or Flying Childers, just as may be seen scions of houses, dating a descent from the days of chivalry and "derring-do," painfully below the average in physical and mental qualities.

But what I hold is, that the properly selected thoroughbred sire mated with working mares of the best stamp—let them be crossed in breeding as you will—will give the best horse for riding and light draught work. (I am not referring at the present time to heavy draught animals.)

The craze of the present day seems to be to select as a sire a bulky, overgrown, round-boned brute, with immense hips and crested neck, and if possessing extravagant action, so much the better. As this article prances round the show ring (on the soft side) many of the bystanders ejaculate: "What substance! What action! A type of what a sire should be! What a stamp of cart horse I should get if mated with my mares!"

The bulky carcass is the result of stuffing, and the exaggerated action as much the result of the judicious use of weights and careful driving as of breed. Ask his owner if he has ever had a saddle on his back, or felt the collar. Hackney he may be in name, but as a rule far from it in nature. He once was, in the true acceptance of the term; now the only remnant he retains of the old Norfolk trotting horse, is his name.

If a man were breeding racing stock, would he pick his sires by form at a glance in the saddling paddock and not by the register of his performances on the turf or over sticks? If he were a breeder for the trotting track would he fancy the selection of his own eye against the performances registered in the Trotting Register? I think not.

From good horses we breed good horses. Speed and endurance, as well as conformation, are undoubtedly hered-

itary, so why in the name of sense for these qualities breed from a sire who with his sire's sire, &c., has never done a day's saddle or cart work in his life!

I feel certain that in this country (Cape Colony and its sister states), we are laying up for ourselves trouble, and heaps of it, in having so much truck with the Hackney. We want horses which can and will do work, be it saddle or cart. We have not the varied

markets of Europe, where style, show and action are in certain cases valued above endurance and hardihood.

When the Hackney's progeny have shown their real worth in this country, and we see what poor performers they are of a journey—in the South African acceptance of the term—how liable they are to diseases, splints, spavins and curbs, we will, I am sure, regret having so much to do with them.

Correspondence.

To the Editor Agricultural Journal.

THE LABOUR QUESTION.

DEAR SIR,—Will you or some of your readers inform us what the result will be on the very limited supply of native labour, by the multiplication of small farms which it is the policy of our Government to inaugurate?

Small farms require, proportionally, far more labour than large, and it is a matter of notoriety that, on existing holdings, production is now largely curtailed by lack of labour. It would appear that the result of multiplying employers in a labour-starved country will be to diminish production, and not to encourage it.

Supposing 1,000 emigrant families be put on the land, before a single native would be used by them for production there would be 2,000 withdrawn from productive pursuits for nurses and kitchen Kafirs; then a 100-acre farm will require a driver and voorlooper, as much as a 2,000-acre one, etc., etc. Perhaps a little discussion on this point would enlighten our darkness.

Yours &c.,

A (would be) EMPLOYER
OF LABOUR.

AUSTRALIAN BUG.

DEAR SIR,—Whilst pruning some orchards during the last fortnight in this city I found the Australian Bug (*Icerya Purchasi-Maskell*) on apple trees. I have seen it on all kinds of citrus trees and rosés but not before on apple trees, and I should like to ask our Government Entomologist, Mr. Claud Fuller, through your columns, if he would kindly inform me if this bug will do as much damage to apple trees as the Woolly Aphis, as I found the bugs on branches badly infected with the Woolly Aphis.

Yours truly,

J. H. SPENCE.

303, Greyling Street,
P'Maritzburg.

[The so-called "Australian Bug" is not an injurious pest in Natal, owing to the presence of its natural enemies, which keep its numbers in check. Occasionally a colony gets sufficiently large to injure an individual plant, but this is rare. An individual bug or two are sometimes seen on apple trees, but never sufficient to do any damage. — CLAUDE FULLER, Entomologist.]

Argentina.

IN an interesting article on "Recent Features in Argentina's Agricultural Progress," contributed to the *Journal of the Board of Agriculture*, Mr. Herbert Gibson says that the Argentine *estanciero* has some reason to reflect upon the sweet usefulness of adversity. It was the crisis of 1890 that drove him from speculation back to the land; it was lack of capital that induced him to call in the colonist to convert his rough grazings into lucerne pastures; and it was the outbreak of foot-and-mouth disease that developed the frozen meat trade for him, and forced upon his notice the profitableness of the cow for dairy purposes. The dead meat trade has taught him that sheep of neat size pay better than bulky animals, and has led up to the export of carcasses of lamb—quite a new development. The up-grading of cattle and sheep is going on rapidly, now that the export trade has convinced the most careless or dilatory breeder that Great Britain will have no

meat but that of well-bred animals. Without feeling assurance in the accuracy of the common estimates of cattle to the number of 28,000,000, and of sheep to that of 120,000,000, being in existence in Argentina, Mr. Gibson deems it a reasonable expectation to count on an exportation of 10,000,000 cwt. of beef, alive or dead, and 5,000,000 cwt. of mutton per annum by the end of the present decade. In 1895, he says, it was difficult to gather 40,000 steers in all Argentina good enough in quality to suit the British market, whereas, in 1902, the output was a quarter of a million. Still he thinks that it will require three generations (presumably cattle generations) of crossing rough cattle with pure Shorthorn and Hereford bulls before the requisite quality for exportation will be common. With respect to dairy produce, as recently as 1898 the production of butter barely exceeded the consumption in Argentina; but in 1902 over 4,000 tons were exported.

Nitrogenous Manures.

THE following account of purely nitrogenous manures is taken from an article on "The Purchase of Artificial Manures" that appeared in the *Journal of the Board of Agriculture* for March, 1902:—

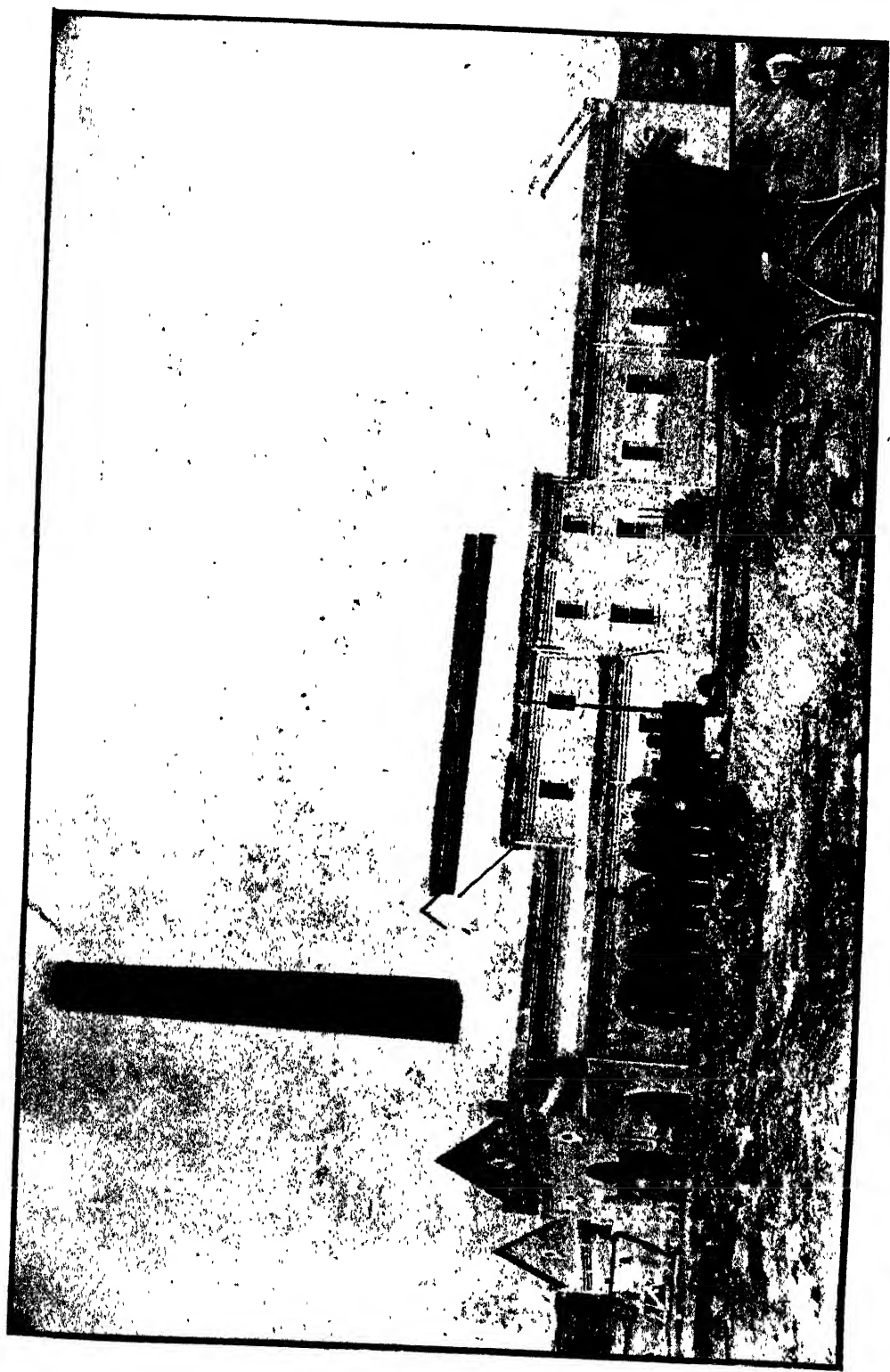
The most important of these are nitrate of soda and sulphate of ammonia, others in general use being rape dust, blood, meal, shoddy, etc. It is often difficult to say for which of these two manures the conditions are most suitable, and then the question should be decided either by the relative cost of the substances, or by using a certain amount of both.

If one of the organic manures can be bought at a cheap rate it may be used

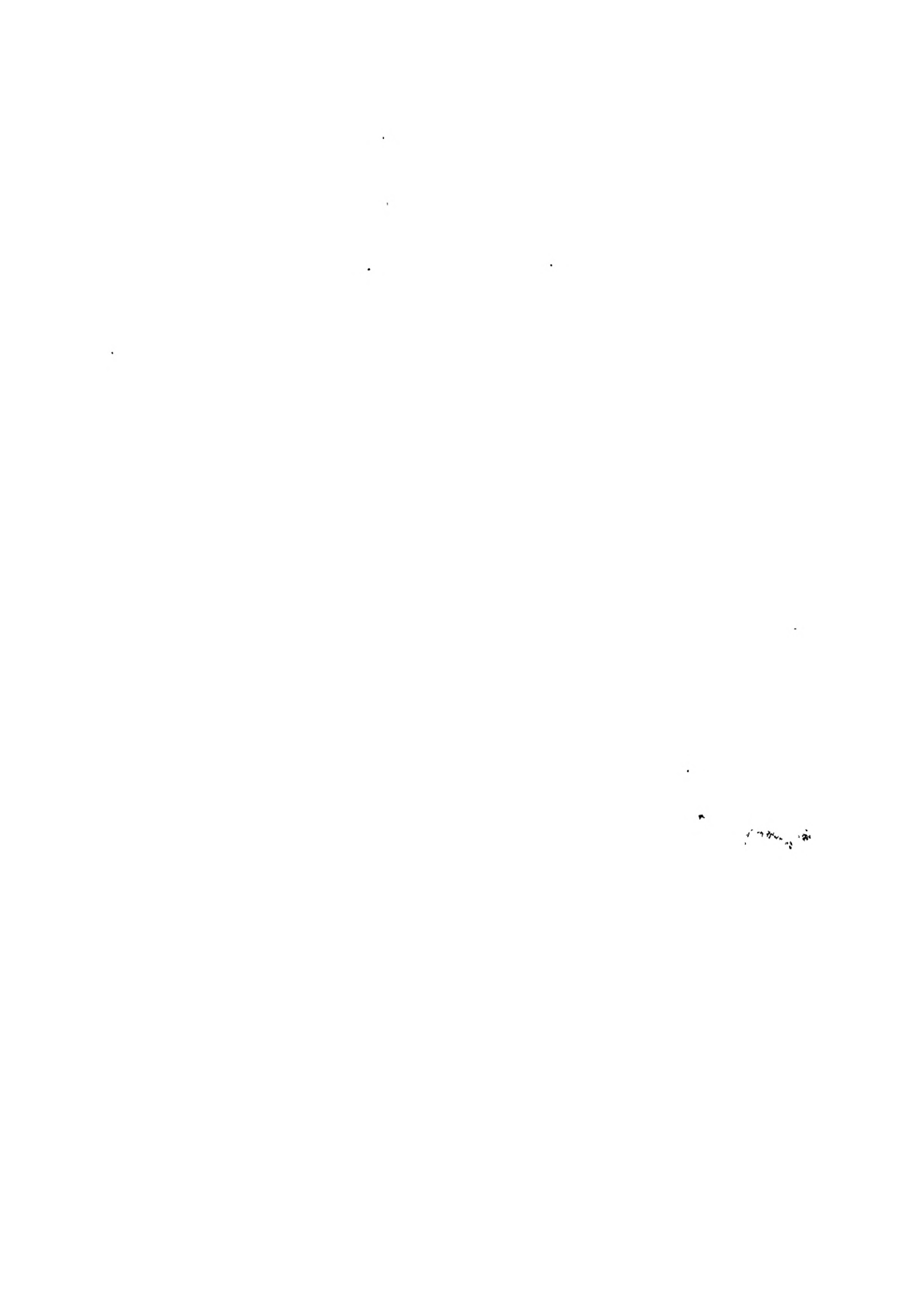
to some extent as an ingredient of a mixture.

Nitrate of soda and sulphate of ammonia are apt to be lumpy, therefore the buyer should look carefully to the mechanical condition. Nothing should be applied that will not pass a $\frac{1}{2}$ inch riddle. Lumps larger than this will often kill plants with which they may come into contact.

Nitrate of soda is generally offered on the basis of 95 per cent. of purity (equal to 15.6 per cent. nitrogen or 19 per cent. ammonia), while commercial sulphate of ammonia usually contains 97 per cent. of the pure article (equal to 20.6 per cent. nitrogen or 25 per cent. ammonia). Sulphate of ammonia is thus much the more highly concentrated manure.



SUGAR MILL AT TINLEY MANOR.
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Stock Diseases Proclamations in force.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos. 38, of 1894, 1, of 1896; 34, of 1896; and 3, of 1897; or of any Act to be construed therewith, or of any Proclamation which may be issued thereunder.

PROCLAMATION No. 43, 1900.

Principal Veterinary Surgeon under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION No. 54, 1894.

Importation of dogs into Natal prohibited except under certain conditions.

PROCLAMATION No. 8, 1901.

Regulations under Lung sickness Act. Cattle allowed to leave an infected area upon written permission from Principal Veterinary Surgeon.

PROCLAMATION No. 50, 1901.

Cattle from Basutoland prohibited from entering Natal.

PROCLAMATION No. 20, 1901, and 52, 1902.

Zululand declared an infected area. No cattle allowed to leave or enter that Province.

PROCLAMATION No. 46, 1903.

Cattle allowed to enter Zululand upon permit from Principal Veterinary Surgeon.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district allowed to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 98, 1901.

Cattle from Transvaal prohibited from entering Natal.

GOVERNMENT NOTICE No. 506, 1901.

Any part or parts or any material prepared with or from animals affected with or having died from Rinderpest may not be introduced into Natal nor be removed from one place in Colony to another, except under written authority from Principal Veterinary Surgeon.

PROCLAMATION No. 36, 1902.

Importation of cattle prohibited from following countries:—The Colony of Rhodesia; the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36, 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston, inclusive.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district permitted to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 15, 1903.

Cattle from East Coast of Africa prohibited from being imported into Natal.

PROCLAMATION No. 25, 1903.

Certain areas—Zululand and districts of Vryheid and Paulpietersburg declared infected areas on account of Rinderpest.

PROCLAMATION No. 63, 1903.

Importation into Natal of cattle, sheep, goats and pigs from Argentine prohibited.

PROCLAMATION No. 77, 1903.

Importation into Natal of horses, mules and cattle from Mauritius and India prohibited. Under certain conditions animals from India may be imported into Natal.

PROCLAMATION No. 79, 1903.

Portion of Ingwavuma district, Zululand, declared an infected area.

PROCLAMATION No. 82, 1903.

Sans Souci, Estcourt Division, and surrounding farms declared infected area.

Weekly Rinderpest Report up to 4th August, 1903.

Locality.	Number of Deaths.	Number of Sick	Number of Deaths to date from the 26th May, 1903.
<i>Estcourt Division.</i>			
Sans Souci ...			1
<i>Zululand.</i>			
Eshowe District	15	25	159
Umlalazi District	9	13	51
Lower Umfolosi District			20
Nkandhla District	16	13	203
Mahlabatini District ...	...	1	43
Ndwandwe District ...	15	29	58
Hlabisa District	6	7	10
Paulpietersburg District ...			7
Vryheid District	...	...	27

4th August, 1903.

M. J. HIME
(For P. V. SURGEON).

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 26a.—Has had some years' experience in New Zealand. Father is a Veterinary Surgeon, and correspondent has studied veterinary practice. Has had over three years' experience of "station" work, and has also had experience in poultry farming and market gardening.
- No. 34a.—Has been Coffee planting for five years in Peru. Is anxious to acquire experience under local conditions. Is prepared to give services at first in return for board and instruction. Is interested in fruit growing.
- No. 43a.—Is at present a student at the School of Agriculture, Kutt', near Berne, Switzerland. Will have completed his studies by March, 1904. Is desirous of obtaining a situation as a manager or under manager of a farm, and will be glad to correspond with a local farmer with a view to engagement. Is of German nationality.
- No. 44a.—Young lady of English parentage, who has had two years' training in poultry farming at Lady Warwick's Hostel, and who has also been at Reading College Poultry Farm, is open to accept an appointment for a year or two, where she will be able to acquire local experience of poultry farming.
- No. 45a.—Englishman. 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 48a.—Englishman of 32. In England was interested both in stock and agricultural farming. Has had ten years' ranching experience in Texas, U.S.A. Produces good testimonials. Is well up in dairying, butter-making, and sheep-shearing and butchery work.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.
- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 56a.—Englishman, aged 22. Had eighteen months' dairy experience in Warwickshire; afterwards three years in New Zealand where operations were of an extensive nature. Has a knowledge of station and pioneer work. Considers himself a competent dairy hand.
- No. 57a.—Single young man of Scotch parentage, aged 25, who has had 'eight years' practical experience at Home, where general farming operations—agriculture and stock—were undertaken. Chief agricultural crops were wheat, barley, oats, turnips and potatoes. Cattle, more particularly Shorthorns, sheep and horses, principal stock. Is well up in rearing and breaking in of horses. Is an abstainer.
- No. 59a.—Scotsman, 21, "with two years' local experience, seeks employment on farm. One year was spent on farm where general stock and agricultural farming operations were undertaken. Second year, chiefly devoted to poultry farming. Has thorough knowledge of the management of horses.

From a statement published in a recent number of the "Tidskrift för Landökonomi," it appears that there are now 1,057 co-operative dairies in Denmark, with an estimated capital of nearly £1,400,000.

The farmers of Japan raise perhaps the heaviest crops known to the world, and the superior productiveness of the small lots of land held by peasant proprietors will be acknowledged from the fact that, with but 11 million acres of cultivated land, 34½ million people are fed and clothed for the greater part, and are still able to export 25 million lbs. of tea, 3 million lbs. of raw silk, and 35 million lbs. of rice.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	N. Grant ...	Branfontein
		"	J. Balfe ...	Frere
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	F. R. Moor ...	Greystones
		"	J. G. Hatting ...	Rama
		"	A. C. Harding ...	Meadow Bank
		"	H. J. Hatting ...	Kopiegte
J. Button ...	Estcourt, South of Bushman's River	"	Unknown ..	Mooi River Pound
		"	J. E. Oates ...	Eversdale
		"	J. Piccione ...	Greenfields
		"	J. Lawrence ...	Grantley
J. J. Hodson ...	Lion's River ...	"	W. Fletcher ...	Erina
		"	W. Henderson ...	Hilton
E. J. B. Hosking ...	Upper Umkomazi	"	M. A. Sutton ...	Shaw's Flat
K. Soutar ...	Portion of Lion's River	"	J. A. Vanderplank	Ntimbankulu
		"	K. Soutar ...	Stey Braes
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe
W. Wilson ...	Polela ...	Lungsickness	Nkangala ..	Mount Sergeant
		Scab	J. D. Watson ...	Rainbow
		"	H. Nicholson ...	X.L. Farm
		"	H. Brown ...	Prosperity
		"	J. Stone ...	Gowrie
		"	J. Comrie ...	Hepburn
J. A. Trenor ...	Alfred ...	"	W. Niemack ...	Macton
W. Gray ...	Upper Tugela, South of Tugela River, and Estcourt, North of Bushman's River ...	"	Yolwayo & Nvuna	Location
		"	N. J. Vandermerwe	Gourton
		"	W. P. Gray ..	The Heff
A. H. Ball ...	Weenen ...	Lungsickness	Seddon & Harris	Weenen Commonage
		Scab	C. R. Leroux ...	Waterfall
		"	A. D. J. Taylor ...	Baconsfield
		"	L. J. Lotter ...	Waterfall
		"	J. P. Lotter ...	Berg Vleit
		"	J. J. Vermaak ...	Winterhoek
		"	G. J. Vanderwest-huyse	"
		"	C. J. van Rooyen	Annadale
E. Varty ...	Umvoti, Western	"	C. P. F. van Rooyen	Mona
	Portion	"	J. G. Nel ...	Elladale
C. J. van Rooyen...	Krantzkop ...	"	G. T. Van Rooyen	Pampoenek
		"	D. J. Martens ...	Jammerdal
		"	Nuss Bros.	Salem
R. J. Raw ...	Impendhle ...	"	Albert Meliffe ...	The Forks
R. Vause ...	Ixopo ...	"	A. Watson ...	Forest Hill
C. Swales ...	Umlazi ...	Lungsickness	Cold Storage and Supply Co.	Richmond Farm, near Pinetown
		"	Native, Sam Pawkes	Assegai Kraal, near Botha's Hill
		"	John, & Mr. Kirk	Umlazi Location
		"	Miss Scott ...	Glenugli, New Germany
A. Hair ...	P.M. Burg City and Umgeni	Scab	E. Taylor and Umbabana	Zwartkop Location

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
A. J. Marshall ...	Dundee ...	Scab	Sai M'Lief ...	Banff
		"	N. Glutz ...	Swiss Valley
		"	H. Thorn ...	New Port
		"	Willie Africa ...	Waschbank
		"	N. B. Surtees ...	Gainsford
C. E. Walker ...	Umsinga ...	Lungsickness	Mooty Metwa ...	Zietman's Drift
		Scab	Blabelela ...	Location
		Lungsickness	Umtagati ...	Mhlezunga
		"	Mbitgi ...	Craigneathen
		"	J. S. Vanderwesthuysen ...	Pomeroy T. Lands
J. Chaplin ...	Klip River ...	"	Mahakana ...	Jobsdale
		"	James ...	Kleinfontein
		"	Malandala ...	Matowan's Kop
		"	Umbali ...	Kleinfontein
		"	Matobula ...	"
		Scab	Thorndale & Co. ...	Endvogle Vlei
		"	W. Wright ...	Colworth
		"	M. H. Wessels ...	Doornkloof
		"	A. G. Boers ...	Marias Hevel
		"	C. Coventry ...	Groote Hoek
		"	R. Horsley ...	Warwick
		"	M. J. Wessels ...	Morden
		"	S. Schoeman ...	Maritz Drift
		"	C. M. Wessels ...	Welkom
		"	P. Nicholson ...	Hobsland
		"	W. Leathern ...	Clydesdale
		"	Mabatehi ...	Georgina
		"	H. W. Boers ...	Alexandra
		"	Mrs. M. K. du Plessis	Maggiesdale
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	W. Newton ...	Excelsior
R. Wingfield-Stratford	Utrecht ...	"	Unknown ...	Acton Homes Found
		"	J. Voss, sen. ...	Charlestown
		"	H. Benkes ...	Roodekop
G. Daniell ...	Vryheid ...	Lungsickness	B. E. A. Rabe ...	Emyati
		Scab	Sikwata ...	"
		"	H. Steencamp ...	Bloemhoff
		"	G. Vanderwesthuysen	Vaalkopjes
		"	Chas. Mossop ...	Cliffdale
		"	W. Hankey ...	Bergendal
		"	Umshigashi ...	Welgevonden
		"	Umfumwa & Dehla	Waterval
		"	F. Combrink ...	Bankroet
		"	Kumandi ...	Hlobane
		"	T. Pretorius ...	Sterkspruit
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Kwapela & Silemela	Welverdiend
		"	Umsauw ...	Langverwacht
		"	J. J. Gove ...	Uitzicht
		"	H. Davel ...	"
		"	Solyelana ...	Leuwnek
C. T. Vaughan ...	Paulpietersburg ...	"	Umkonyana ...	Welverdiend
		"	Stumpf ...	P. P. Burg T. Lands
		"	Natives ...	Jachtbaan
		Scab	— Heine ...	Bedrog

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 13 herds of cattle under license for Lungsickness, and 7 flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni								
Districts	...	...	...	...	3 for Lungsickness	3 for Scab.		
" Nkandhla and Ngutu Districts...	...	...	...	...	"	4 "		
" North of White Umfolosi and Umfolosi Rivers	...	...	...	10	"	"		
Total					13	7		

Rinderpest exists at undermentioned places:—

Estcourt Division.—Sans Souci.

Zululand.—Eshowe, Umlalazi, Mahlabatini, Lower Umfolosi, Nkandhla, and Ndwandwe Districts
Vryheid District, Paulpietersburg District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 4th August, 1903.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of July, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES)			RAINFALL (IN INCHES)						
	Means for Month.		Minimum for Month	Total for Month	No. of Days	Heaviest rainfall in one day		Total for Year from July 1st, 1902	Total for same period from June 1st, 1901	
	Maximum	Minimum				Fall	Day			
Central Experiment Farm (Manager) ..	82	32	...	26	6	11	17th	26	...	
Estcourt (James Lewi-)	71	24	...	57	2	42	17th	57	17	
Nottingham Road (C. J. King) ... ..	...	...	...	45	4	32	17th	45	46	
Adamshurst	90	40	...	24	4	12	17th	24	33	
Hilton (Henry V. Ellis)	81	36	...	45	6	25	17th	45	42	
P.M.B., Town Bush Valley (Wilkinson's Nursery) ... ..	...	...	...	67	4	22	11th	67	...	
Ixopo, Gorton (Chas. Green)	72	48	...	05	3	02	16th	05	04	
Mid Illovo, Ismont (A. N. Montgomery)	74	42	...	54	2	21	11 h	54	50	
Ottawa (G. Wilkinson) ... ..	...	...	...	...	...	...	...	...	...
Mount Edgecombe (Natal Estates) ...	87	46	...	65	5	20	12th	65	25	
Corubia ... ..	...	...	...	80	...	...	...	80	23	
Milkwood Kraal ... ..	...	...	...	25	...	...	...	25	13	
Blackburn ... ..	...	...	...	77	...	...	...	77	18	
Saccharine ... ..	...	...	...	50	...	...	...	50	24	
Prospect Hall ... ..	...	...	...	66	...	...	...	66	20	
Clairmont (J. R. Blamey) ... ..	...	...	...	97	4	52	12th	97	37	
Equeefa (W. Hawksworth)	85	48	...	87	7	37	7th	87	22	
Umzinto, Beneva (E. W. Hawksworth)	...	...	...	86	6	37	6th	86	34	

Pound Notices.

THE following stock, unless previously released, will be sold on the 2nd September next:—

Jackal Spruit.—One bay horse, little white on both hind fetlocks, poor in condition, about 8 years of age, both front knees bruised, height about 14'1, no brand visible infected with skin disease on head, probably scab.

Richmond Road.—Large red ox, old, knock-kneed, indistinct brand off hind quarter, grey patches on both hind quarters.

Normanhurst. Two red and white oxen, no brands.

Woodstock.—Ram, two nicks out of left ear, one nick out of right ear; marked what looks like D. J. on left side, indistinct mark on right side, no horns, probable value £1. Impounded 22nd July by Geo Norton. The above animal will be sold at the expiry of one month from this date (31st July) if not previously released.

District Reports.

BULWER, 31st July.—The weather is very mild and pleasant just now, but I do not expect this to last long now August is close on us. The usual changeable weather will be the order until mid-spring. I have just returned from a visit to the Southern border of the division adjacent to East Griqualand. I was very much struck with the greenness of the grass underneath, instead of being dried up to chips. On the Umzimkulu, notwithstanding this being the worst time of the year for the veld, there is plenty of grass for all kinds of stock. In the low-lying parts the grass is springing. When in the Qalingeni Range, overlooking the Ngwangwana River, I came across a good lot of stock in the pink of condition and could not account for this at the time, but when I entered the heart of the Forest of this name I soon found what was keeping the stock in such splendid condition. The grass inside the Bush, known as the Balie grass, is beautiful and green and in abundance. Horses and cattle were to be seen grazing comfortably in the Bush. I should think from my experience of the past four years in Polela Division this is one of the best winters that has been experienced for a long time. As regards crops, I saw very little land with crops, but a good deal of land is being ploughed up. I noticed the Rotary Dutchman plough at work on the farm Springfield by Mr. Gordon. I asked him how he liked it. He said it worked well but required skilled management, natives, for instance, could not manipulate the machinery of the plough. This was a three-furrow plough, requiring 14 oxen to draw it. As regards the mealie crops, the word had hardly applied, as on the Umzimkulu Location there was next to nothing reaped by the Natives, and most of the Europeans a very little better. On the Umkomanzi River, in some places fairly good crops of mealies and mabele were reaped. Also in the Ingudwini Location. In all other parts of the district the crops were destroyed by the frost. The potato has not been a success also this season; some farmers attribute this to a want of change in the seed. The same seed has been used for years on some farms, and a change should be beneficial. The forage crops have been light but fairly good. The hay was very good, and a plentiful supply was obtained. As regards stock, there was one outbreak of lung sickness reported in a span of oxen just returned from Pietermaritzburg transport-riding. One ox died, and one was killed for inoculation, but, strange to say, there have been no more cases. I am inclined to think it was not lung sickness. The disease commonly called the Redwater or Tick Redwater has been very prevalent in the district, even late in the autumn. There were several cases. Altogether a considerable number of cattle died of this disease. Cases of Black Leg or Quarter-evil occurred in the village in the autumn, which is unusual for this part of the country. Horses and sheep, as far as I know, have been free from disease. I only heard of one case of horsesickness.

H. W. BOAST,
Magistrate, Polela Division.

STANGER, 29th July.—During the past month, the weather, with the exception of a few showers, has been very dry. There is little or no water in the small streams close at hand, and the inhabitants of Stanger, who are not fortunate enough to have large tanks, have now to cart water from the Umvoti River, a distance of over four miles. It is a great pity that the householders of the village did not take advantage of the water supply scheme when the opportunity offered. Stock is looking well throughout the district, and I am pleased to be able to report that there are no cases of Lung sickness or Rinderpest. Cattle appear to be increasing slowly, and small herds are to be seen at a number of kraals now where, formerly, there were only one or two head. The new Sugar Mill, erected by Messrs J. L. Hulett & Sons, at Tinley Manor, has commenced operations. It has been built with all the latest improvements. With the exception of that at Umvoti, all the Sugar Mills in the district are in full operation, and are, I understand, giving good returns. Mr Hofmeyr, of the Cape Assembly, visited the Kearsney district Tea Estates on the 27th inst., and I hear expressed his surprise and pleasure at the progress that is being made with this industry. Messrs Addison, of New Guelderland, and Jackson, of Stanger, have been experimenting and planting "Paspalum dilatatum" grass with good results. Mr Jackson informs me that this is an excellent fodder for cattle and horses. As the grass bears a large quantity of seed there is every reason to hope that it will spread.

F. P. SHUTER, Magistrate.

UMZINTO, 28th July.—During the last two months very little rain has fallen in this division, with the exception of a few showers, and consequently the country looks very brown, though the pasture in most places is still sufficient for cattle. I am glad to say that stock of all kinds has been healthy throughout the country, and that of late we have been spared any epidemic of Lung sickness or Rinderpest. The season has been exceptionally cold for a coast district, and on the lower lands there have been occasional hard frosts. The prevailing wind has been from the south-west, and laden with a very low temperature at times. It has been exceptionally dry along the coast, particularly about the Lower Umwalumi and lower Umkomaas, and in fact in these districts there has hardly been sufficient rain to fill the water tanks. There is, however, strong evidence of an early season, the peaches, mangoes, avocado pears and other fruit trees being already in

flower. The mango seems to thrive best in a dry season, and requires very little moisture, particularly while the fruit is growing. The sugar-cane looks remarkably well at present, except where slightly frost-bitten in the lower lands. Most of the mills are at present in full operation, and I understand that the juice is standing at a very fair density, and the yield, from most fields, good. Messrs. Reynolds Bros' large mill is at present kept in full swing, and is turning out large quantities of very good sugars, and the same may be said of Messrs. Bazley Bros., Ifata, Mr. G. W. Hawksworth, of Beneva, and the others. The mealie crop has been a very fair one along the coast, though further inland, in the Dumisa and Hlogozu districts, it has been rather sparse. The price of mealies at Umzinto at present is about 20s per muid, and crushed mealies and meal range from 21s. to 23s. I have heard no complaints yet from the natives in my division of scarcity of food. The township of South Barrow, Lower Umkomaas is at present very full of visitors from all parts of the up-country, and is now quite the most fashionable sea-side resort. It is calculated that at present between South Barrow and Wid-nham there are over 700 visitors. Scottsburg and all the other places along the coast are also full of visitors at present, and in fact every available house and cottage along the coast is occupied. His Excellency the Governor and Lady McCallum are at present among the visitors to the county, and are now staying at the Lower Umkomaas. The inhabitants and visitors are much gratified by their presence among them, and, by their affable and kindly manner they endear themselves to all who have the privilege of meeting them.

JAS. McLaurin, Magistrate.

GREYTOWN, 27th July.—Fruit-growers should attend at the present time to their peach and plum-trees. The black aphides are a serious matter. If the trees are examined they will probably be seen to have colonies of these insects about the buds; grey ants running up and down the stems and branches will be sufficient evidence of their presence. The tobacco-and-soap mixture prescribed by Mr. Fuller proved very effective in the experiments tried

by myself, and it should now be applied, as the leaves effectively protect a large proportion of insects when the trees are in foliage. I do not know whether the importance of this is sufficiently realised. The weather has been such as to give promise of an early spring here; some growth in the grass is already preceptible as the result of the recent rain. Bees are very numerous and troublesome to householders, living in chimneys, under floors, or in other possible recesses in houses. One wonders why the culture of honey should not be a profitable enterprise as in other countries. It would seem that it would involve but little expense.

J. Y. GIBSON, Magistrate.

MAHLABATINI, 31st July.—The weather has been pleasant on the whole, two or three days being cold enough to make fires in the house pleasant. The maximum temperature was 88 degrees (on the 14th), and the minimum 41 degrees on the 13th. No rain fell during the month with the exception of the 17th and 18th, when slight showers fell. The district is at last free from Rinderpest; although I regret to report two outbreaks of Lung sickness at the Bekamuzi. The cases are in the hands of Inoculator Chapman, who is doing all that is necessary. Native sheep have died in considerable numbers, from what the Dutch call "Jillietki"—a sort of apoplexy; in one herd they were dying at the rate of two a day. I dosed each with a teaspoon of jalap, and changed their pasture. It had the desired effect, as none have died since. Large quantities of mealies are being introduced by natives, and others into the District, and prices range from £2 to £2 5s. The demand is increasing.

A. J. S. MARITZ, Magistrate.

NDWANDWE, 27th July.—The weather during July has been dry, with high winds from the north and south-west. Temperature registered maximum 82, minimum 43, rainfall .52. Cattle are in good condition. The original outbreak of rinderpest, which started over a year ago, has been stamped out, but unfortunately a new outbreak, in a portion of my district not previously affected, has occurred. The origin of this outbreak is uncertain, but is supposed to be from transport oxen from the Eshowe Division. Six kraals are affected.

A. W. LESLIE, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—There is absolutely nothing of importance to report, and one hears the same complaints from all and sundry, viz., that trade is as bad as it possibly can be, and money is a thing often heard about but very seldom seen. The new Convention, we are told, comes into

operation on the 15th, but in these days of surprises and contradictions people have grown somewhat sceptical; and, until it becomes an absolute positive fact (having been bitten once), it will be premature to say what the measure may bring forth.

Mealies.—A few Natal mealies were disposed

of on the market at prices varying between 10s. 6d. and 11s. per 100lbs.; but the bulk of grain consumed in the City is either North or South American.

Forage.—From 7s. to 9s. per 100lbs.

Green Barley.—The market is well supplied at present, and prices have fluctuated between 2s. 6d. and 2s. 11d. per 100lbs.

Hay.—Notwithstanding the oft-repeated assertions of some farmers, the market at present is fairly well supplied, and prices have been as low as 1s. to 3s. 6d. per 100lbs.; a demand one morning, when supplies were short, sent prices up to 8s. 9d. per 100lbs.

Potatoes.—From 6s. to 13s. per 100lbs. Sweet potatoes, 3s. 9d. to 7s. per bag.

Bedding.—From 6s. to 21s. per load.

Onions.—About 24s. per 100lbs.

Pumpkins.—While several samples have been as low as 4s., 6s., and 7s. 6d. per doz., others have realised 20s. 6d. per doz.

Tobacco.—From 1s. 2d. per lb.

Mabele.—Very little offering. One sample in the market realised 13s. per 100lbs.; but imported mabele is considerably higher.

Beans.—From 20s. 3d. per 100lbs.

Poultry.—Common fowls, from 1s. to 3s. 8d. each; guinea fowls, from 6s. to 9s. per brace; turkeys (cocks), 15s. each; (hens), 8s. each; ducks, from 4s. 3d. to 10s. 3d. per pair.

Eggs.—From 1s. 6d. to 2s. 5d. per dozen.

Butter.—From 101. t. 2s. 8d. per lb.

Sundries.—Beef, 3½d. to 5d. per lb.; pork, 4d. to 9½d. per lb.; mutton, 5d. to 10d. per lb.; hams, 9d. per lb.; bacon, 6d. to 7d. per lb.; veal, 10½d. to 1s. 3d. per lb.; cheese, 9d. per lb.; doves, 6d. to 9d. per brace; partridges, 2s. to 2s. 9d. per brace; trussed fowls, 3s. 6d. to 4s. each; pigs, 11s. 9d. to 40s. each; sucking pigs 4s. to 7s. 3d. each.

Vegetables.—Beans, beetroot, cabbages, celery, carrots, cauliflowers, eschalots, lettuce, peas, onions, parsnips, tomatoes, and turnips.

Fruit.—Very little offering at present; nearly all the varieties are from the coast, viz., bananas, lemons, loquats, oranges, nartjes, limes, pawaws, and pineapples.

Firewood.—From 5½d. to 11d. per 100lbs.; cut, 9½d. to 1s. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business keeps bad, and affairs in the mercantile world could hardly be worse.

Mealies.—South African whites are worth about 10s. 6d. per muid, and North American 12s., though the latter figure is under cost. The market is fully stocked, not to say glutted.

Forage brings about 10s. 6d. per 100lb., with no demand worth speaking of.

Potatoes.—Good samples fetch 17s. 6d., and are decidedly scarce; inferior qualities 14s. The tendency is a rising one, and in all probability prices will appreciate smartly before long.

Seed Potatoes are in great request, but are difficult to obtain.

Onions are in good demand; the market will be much relieved by the lowering of the duties after 15th inst.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1900, writes:—Since my last report the market has changed considerably. Prices on all stocks are coming down all round. The ruling prices for the week ending 1st August were as follows:—

Barley Bags, 163lbs., for Seed.—Very little has been offered for sale, as the season for sowing this is about over, realising 16s. to 16s. 6d. per bag.

Barley, per 100 Bundles for Forage.—This remains firm, and a fair quantity of this offered daily. Prices from 39s. to 47s. 6d. per 100 bundles.

Bran, per 100lb. Bags.—No colonial or Natal wheat bran offering on our market. Only Argentine bran and Australian bran are being sold, from 9s. 6d. to 10s. per bag.

Bales of Chaff, per 100lbs. Of this a fair quantity is being offered daily, and realises very fairly from 8s. 9d. to 10s. 6d.

Mabele, per 203lbs.—No South African stocks are being offered on the market excepting Delagoa Bay corn. There is also some Bombay corn; the former sells at 16s. per bag, and the latter 17s. to 18s.

Hay (Manna), per 100lbs.—Very little coming on to the market, and selling from 8s. to 8s. 6d.

Hay (Natal), per Bale.—Every day fair parcels are being sold, averaging from 70lbs. to 80lbs., at 2s. to 2s. 9d. per bale.

Forage, per 100lbs. (Oathay).—Large parcels are being sold daily, and prices coming down considerably, realising from 6s. to 7s. 6d. and 9s. to 10s. according to quality.

Mealies, per 203lbs.—Very little Colonial and Natal coming on the market, nor local or Orange River Colony, and what does come for sale only realises from 21s. to 22s. South American 18s. 3d. to 18s. 6d.

Onions, per 123lbs. Bags.—The market is again overstocked with this, and sellers are losing money daily, as this is now sold with a loss of at least 3s. per bag, prices 15s. to 18s.

Potatoes, per 163lbs.—The market is pretty well supplied, but good potatoes always command a fair price. For local fresh early rose, 27s. to 30s.; good Natal or Cape Colony early rose, 25s. to 26s.; other good potatoes, 22s. to 24s.; medium, 18s. to 20s.; inferior, 12s. to 14s.

Eggs, per doz.—Local fresh, 3s. 6d. to 4s.; imported Colonial, 2s. to 2s. 6d.; imported overseas, 1s. to 1s. 6d.

Poultry.—Ducks, from 5s. 9d. to 7s. 6d. each; fowls from 2s. to 4s. each; geese, from 8s. to 11s. each; turkeys (hens), 7s. to 8s. each; (cocks), 12s. 6d. to 17s. each.

Game.—Bleaboks, 60s. to 65s. each; springboks, 40s. to 45s. each; partridges 3s. to 3s. 6d. per brace; koran 4s. 6d. to 5s. per brace; guinea fowls, 7s. 6d. to 10s. per brace.

Cattle.—Xen (slaughter), £20 to £22 10s. each; oxen (trek), £13 to £15 each; milch cows, £25 to £30 each; or inary, £12 to £14 each; heifers, £12 to £15 each; colliers, £10 to £12 10s.; goats, 20s. to 27s. 6d.; sheep, 12s. 6d. to 15s.

The Agricultural Journal

AND MINING RECORD.

VOL. VI.

FRIDAY, AUGUST 21, 1903.

No. 15.

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Judging at Shows.

THE interesting correspondence on this widely extending subject continues, and, in consequence, the review we proposed making is deferred. Without going into the broad principles raised, we would, on this occasion, make some reference to the minor question of Judges' expenses out of pocket. On this point the correspondents are almost unanimous. In the first place, let us take the question of railway tickets. Judges, we certainly think, should have their fares paid, and if

such payment should prove too heavy a strain on the resources of the shows, would it not be well, either directly by a petition from all the societies, or through the Natal Farmers' Conference, to ask the Government for free passes? On this point, as indeed on the whole subject of judging at shows, it is almost unnecessary to say that the views expressed are solely those personally held by the Editor. If the Government should consider the granting of the request unde-

sirable, the trouble lost would not be great. In the matter of paying travelling expenses, a question of greater difficulty and some delicacy arises. Under our system of judging, there are, perhaps, some Judges who would prefer not to accept recompense for these expenses. On the other hand, we think that the great majority would raise no objection, but would regard the payment as a legitimate, and as a business recognition for work which, primarily, is of a business nature. A guinea and a half would, we believe, meet the expenditure for one-day shows. As one of our correspondents has said: - "Even for a pig, good lodging and board are provided." Judges who have qualms, most unnecessary, we think, about the receiving of money for travelling expenses, could easily allay those qualms by presenting the cheque to the society's prize fund. In some instances, it might be considered preferable to make local arrangements with hotels for the entertainment of the Judges. There is another point which should receive attention,

from the Executives of shows, particularly from those of small country shows; we refer to the neglect in meeting Judges on arrival. It is not at all uncommon for Judges, on alighting at the station of the village, to find no one representing the show present. Frequently beds have been arranged for, but none the less, the neglect must be felt, especially by those who are not already acquainted with the village. Judges should be made to feel themselves honoured guests of the show; they should be the recipients of all courtesy and attention practicable. They should, to borrow the words of Mr. A. K. Murray, "have their visit made pleasant for them." The aim of these remarks is obvious we trust. At present, as a rule, Judges do not receive sufficient consideration from those who ask their services; this we consider to be a great mistake. The position of a Judge is one of dignity, and of value to shows which cannot be exaggerated. The better that these facts are realized, the better will become the standard of judging.

Passing Notes.

DISC PLOUGHS.—Yesterday, the day on which we go to press, another trial of disc ploughs was to be held at Mr. John Moon's farm, Manderston. Mr. Moon deserves the warmest recognition for his public spirit in not only giving the use of his conveniently situated farm for these trials, but for the trouble and expense to which these trials must put him. At yesterday's trial, it was arranged that a committee should judge the ploughs. The members of the committee, Messrs. T. Stead, J.P., J. Moon, M. H. Hutton, F. Potteril, and J. Blake, are well known practical agriculturists, and the decisions at which they may have arrived will carry great weight as regards the merits of the particular ploughs submitted to their judgment. About the excellent work of disc ploughs at this dry time of the

year there is now no room for doubt. The desirability of turning over the soil and exposing it to the influence of the weather for some months before the planting season is well known to every farmer; crops come away quicker, grubs—those pests to all mealie farmers—are greatly reduced in number, and by reason of having the land in tilth larger crops can be put in at the planting season. What farmers now want to learn is, which is the best working, the strongest, the lightest in draught, and the cheapest machine. The prices appear high, and in some cases altogether exorbitant. The principle is not patented, and accordingly it is difficult to find justification for the cost of some of the makes. Yesterday's competitive trial should prove of use to many intending purchasers.

BINDING OF THE "JOURNAL."—We imagine that a very considerable number of subscribers do not have their *Journals* bound at the end of the year. This supposition is impressed by the frequent applications for back numbers, applications which very often cannot be met. The cost for binding is now very moderate—see notice in the front page of every issue—and the advantage to be derived is great. In a technical journal such as this, there is always much matter that must escape memory, matter of permanent interest which should be easy for reference. To give one instance only: in the last issue Mr. Sim began a series of articles on Eucalypts. At the present moment a reader may take no more than a cursory interest in the subject, but in the future he may. Then it is possible that the numbers he wants are lost, and at the best the reference will be a trouble.

SUGAR CANE.—The season has again returned for planting this splendid fodder. Readers who wish to refresh their memories about the proper way for planting, etc., should refer to the excellent article on this subject by Mr. Leonard Acutt: No. 10. Vol. V. Cane for fodder can hardly be overpraised; everyone who uses it speaks of it with the utmost favour. It may be opportune to quote what Mr. John Moon said of it in an interview with *Ergates*:—"From that piece of land of only one and three-quarter acres I shall get about 150 tons of first class winter food for all stock. I intend to go in for sugar cane largely. It is going to be the winter food for this district in the future. There is nothing in the way of winter food so easy to grow. I put that little lot in over there five years ago. Six months ago it was cut to the roots, and now, as you see, it is over seven feet high. Since it was planted it has had one dressing of kernal manure. During the summer I feed it to my horses—which work all the year round—and to the pigs."

"Does it give horses diarrhoea?"

"No. Indeed it acts slightly in the opposite direction, and sometimes I have to throw a handful of salts on their feed."

"Do the salts not choke the horses off their feed?"

"Nothing can keep a horse off cane."

"How do you feed it to your horses?"

"It is put through a chaff cutter with one blade off, and mixed as it goes through the machine with about a third of hay or forage."

DEFIBRINATED BLOOD.—The Report of D.V.S. Verney on an outbreak of Rinderpest, and the observations upon the Report by the Principal Veterinary Surgeon, should be read by all cattle-owners. Under the conditions described, the chance of conveying other disease was remote, yet it was there all the same. The precaution recommended by the Principal Veterinary Surgeon should never be neglected, should circumstances point to the advisability of using defibrinated blood. A high temperature, of course, is a distinct sign of danger, but even if the temperature be normal really absolute safety is not assured. It is hardly necessary in this publication to add that serum and defibrinated blood stand practically on quite a different footing as regards the danger of communicating blood diseases.

DIPPING TANK IMPROVEMENTS.—The communication from Mr. G. S. Armstrong, M.L.A., should be read by all who are thinking of erecting dips. As in all mechanical contrivances—especially in their earlier stages—there is always play for improvements, and for reduction in cost. Mr. Armstrong's suggestions seem eminently practical in character, and they should assist in bringing dips within the means of those whose resources are limited.

RAMIE.—Mr. D. Edwards-Radcliffe, of London, writes to the Press on the cultivation of the fibre known as Ramie, or Rhea. Much information with regard to this fibre has been given in the *Journal*; those interested are referred to p.p. 84, 441, and 800 of Vol. I., and p.p. 11, 212, and 754 of Vol. II.

An Australian poultry farmer, in filing his insolvency schedule, alleged the cause to be a plague of rats, which ate up his chickens and ducklings as soon as they were hatched. He estimated his loss by this means at £200.

Rust-resisting Wheats.

THE Department of Agriculture has now for free distribution seed wheat of the Medeah, Belotourka, and Red Egyptian varieties, in 1lb. samples, for trial. Larger quantities may be purchased at 2s. per 10lbs., if there is any surplus after the distribution of the free samples.

The Medeah and Belotourka are highly rust resisting, and the Red Egyptian moderately so.

Applications for free 1lb. samples should be addressed to the Farm Manager, Central Experiment Farm, Riet Spruit, and those for larger quantities (to be obtained by payment) to the Director of Agriculture, Maritzburg.

Department of Agriculture.

NOTICE.—CONSERVATOR OF FORESTS, No. 1, 1903.

TO encourage tree-planting, Transplants and Seeds of Forest Trees are supplied by Government, so far as in stock, at the undermentioned rates, exclusive of carriage, from the Government Nursery, Central Experimental Farm, Riet Spruit.

Transplants of Eucalypts, Pines, Acacias, Casuarinas, Cupressus, &c., about 25 trees in each tin, at 8s. 4d. per 100 trees.

Transplants of scarce kinds, larger trees, or surplus stock, when available, will be charged at special rates, which will be furnished on application.

Tree seeds, in variety, at 1s. per packet. Price per pound, which fluctuates, will be furnished on application.

Orders for present or spring delivery should be addressed to the Conservator of Forests, Pietermaritzburg, and must be accompanied by a remittance in cash or postal order. Cheques cannot be accepted.

T. R. SIM,
Conservator of Forests.

Office of Conservator of Forests,
13th August, 1903.

Growing Lucerne Without Irrigation.

BY J. SLOANE in the "Pastoralists' Review."

AT a time when all pastoralists are deeply interested in forming plans to grow and conserve fodder to tide them over long droughts, a few notes on growing lucerne without irrigation may interest your readers. Mulwala is situated 60 miles from Deniliquin in a dry district. The rainfall since 1896 has been scant and irregular. In 1902 it was only 13.30 in., 430 points falling in the last month. From October, 1901, to December, 1902, only 962 points fell. We commenced lucerne-growing twenty-seven years ago, and have done so since, with

varied results. In the past there have been many failures, and our plans of planting and using the crop have had to be altered. For the last six years we have sown a paddock each August, and it has always established itself. Even in 1902, when the wheat crop failed and we were unable to gather a sheaf of hay.

For the present, at least the drought is over, and our lucerne paddocks have come through it in good heart, even though in some cases the Murray pines have died beside them. They have been a great assistance in enabling us to keep

our sheep at home. Without them we could not have done this unless at a heavy cost for imported fodder.

We work our lucerne very simply, always trying to spare it when short or when there is not sufficient moisture to enable it to grow more than a few leaves. In long spells of dry weather it dies if the shoots are constantly removed. For this reason rabbits are most destructive, and if once they get a footing nothing short of the destruction of all cover and burrows will save the lucerne.

Thorough cultivation is necessary. The land should, after ploughing, be harrowed twice to make a fine seed-bed, then after sowing brushed, harrowed, and rolled. Sand may not require so much harrowing. If heavy rain follows the sowing, there is no need for rolling, but if the season is dry, rolling seems to be imperative to press down the earth and keep what moisture there is in the soil. Our experience of rolling is different from that of your contributor "Trier," who advocates rolling after sowing without harrowing. One paddock here was tried that way, and much of the seed remained on the surface, and even with rain it was not able to get sufficient covering for germination. The soil should be fairly porous, with a clay subsoil within a reasonable depth. If any water lodges on the surface it will kill the plants. Sandhills are not well suited, though the hollows between them where the sand is shallow often give fine returns.

Growers do not agree as to the amount of seed to sow to the acre. We prefer from 4 to 6 lbs. I have inspected a great many lucerne paddocks, and the thickness of the plants on the land gives but little indication of the quantity of seed that has been sown. Only a limited number of plants can be grown on a given area, and it is important to have vigorous roots. When too thick they adopt the policy of the survival of the fittest, when the moisture in the soil fails, and there is a danger of a general die-out. Lucerne draws much of its nourishment from the atmosphere, and it should never be deprived of all its leaves, which are its lungs. Young plants stand hardship and ill-usage bet-

ter than old ones, and it is easier to kill out an old-established paddock than a new one. It is usual to stack stock on to the old paddocks and to spare the new ones. The opposite should be done. This is the chief reason so many people fail to establish lucerne and keep it. The plants continue to increase in size, and ultimately in this country get too big to draw enough moisture from their surroundings. They then die. Unless it can be irrigated, it is seldom that a paddock lasts more than seven or eight years. Allowing old plants to grow to their fullest height in the spring hastens their end if not cut back before the leaves begin to dry. All energy is exhausted, and without heavy rain to cause a second growth, the majority of the plants die.

We have tried maize crops, and twice succeeded in establishing good paddocks in this way, but all our first year failures have come from the nurse smothering the child. This country seems to be too dry for growing two crops at once. The elder takes everything to itself when it ripens, leaving nothing for the younger to carry on with.

Indiscriminate stocking with all kinds of stock is a mistake. Horses soon worry a paddock out by cropping the crowns too closely, and in other ways. No stock do better for themselves than horses. A very little lucerne keeps them, and they never suffer from hoven, so common in cattle. Lucerne that horses have regular access to seldom lasts past a second year. Sheep, especially crossbreds, if constantly on it, eat out the plants, leaving the native grasses, which soon get the upper hand. Cattle do not seem to injure it, even when left on constantly, but when a strong, rapid growth comes after heavy rain, more especially in the spring, there is a danger of hoven. Sheep also get hoven, but not to the same extent as cattle.

While it is important to the lucerne to keep it clear of other plants, it is not an advantage to the stock to have nothing but lucerne to eat. A patch of ordinary grass is a good thing in a paddock—none of it will be wasted. There may be grasses that would make a mixture with

lucerne, but I have not seen them. For obvious reasons, it would be inadvisable to put a whole holding under lucerne. Not more than one-fifth of a holding should, as a rule, be planted. There are difficulties in the way of cutting and stacking lucerne from grazed paddocks, but they can be overcome. Keeping paddocks that are not irrigated for cutting only is out of the question.

All my experience has been without irrigation, though I have seen something of successes and failures with irrigated lucerne, mostly failures probably brought about by want of experience. However, I have grown other fodders by irrigation, and know that irrigated lucerne (the finest of all fodder crops) can only be grown in small patches, and that the

grower must be prepared to employ, say, one man to every 10 or 12 acres. Also, he must have a substantial, ever-flowing stream beside him.

Our results even this year have been satisfactory. In the beginning of January we were bringing lucerne hay from the Hunter. By the end of the month we were cutting our own lucerne for hay, though our ordinary country remained bare of pasture. Since January it has been heavily stocked almost constantly.

Of course these notes give the result of local experience only, and I make no promise that they will apply elsewhere, but I believe there are many places where they will, where the good qualities of the "king of fodder plants" are not sufficiently appreciated.

Garden Notes for August.

By W. J. BELL, Florist and Seedsman, Maritzburg.

TOWARDS the end of this month full crops of the following Vegetables should be sown:—

French Beans (Canadian Wonder), Keen's rustless wax, Burpees green stringless, Yellow podded wax or Butter Beans, and Mont d'or wax, also the Mont d'or and Scarlet Runner Beans.

Burpees stringless is a most delicious bean, and is as its name implies, quite free from stringy matter, and it is green when cooked.

Vegetable Marrow, running and Bush varieties, Custard Marrow, Tomato, Capsicum, Egg plant, Cucumber, Sweet Melon, Water Melon, Pumpkin and Squash.

Make further sowings of Peas for succession, also Beet, Cabbages, Carrot, Lettuce, Radish Salsify, Spinach, Onion, Leek, Parsley, and other Herbs. Full crops of Potatoes should also now be planted.

Where Globe Artichokes and Asparagus are required, sow now for planting out permanently next spring.

Horse radish should be planted now if required. This vegetable is highly prized as a condiment to roast beef, but as a rule it is badly grown. The common practice is to consign it to some neglected corner of the garden where it struggles for existence and produces sticks which are almost useless for the table.

In the same space a plentiful supply of large handsome sticks may be grown with as little trouble as Carrots and Parsnips.

In this climate a position should be selected that will be sheltered from the mid-day and afternoon sun but not overhung with trees or near the roots. A good depth of soil is necessary, and if not present should be artificially made by making a heaped up bed about a foot or so above the general level, taking care to dig over and loosen the bottom soil first and adding a heavy dressing of rotten manure. Select young shoots, each having a single crown, and plant them one foot apart each way. By the Autumn these will become large succulent

sticks and the roots may be dug as required.

Flower Garden.—All varieties of tender Annuals and Perennials may safely be sown now, such as Balsam Cockscomb, Convolvulus, Dahlia, Datura, Globe Amaranthus, Gourds, Sunflower, Heliotrope Ipomea, Zanzibar Balsam, Celosia, Marigold, Sensitive Plant, Nasturtium, Portulaca, and Zinnia. Also sow for a succession some of the hardier varieties, such as Aster, Antirrhinum, Calendula, Candytuft, Carnation, Chrysanthemum tricolor, Carcopsis, Dianthus, Gaillardia, Larkspur, Pansy, Petunia, and Phlox.

Plant out Pansies, Daisies, Gaillardias, Aquilegias, Asters, Carnations, &c., sown in April and May.

Plants of the beautiful Mexican Poppy should be planted from the seed bed (when quite small), about 2 feet apart.

This is a very free flowering perennial and should be in every garden. It is most useful for cutting and lasts much longer than the ordinary Poppy.

Herbaceous borders should now be attended to by digging and manuring. Old clumps of Phlox decussata and other herbaceous plants may be taken up, divided, and re-planted.

For the herbaceous border, the following are most suitable, although not all herbaceous:—Phlox decussata, Pentstemons, Mexican Poppies, Anemone Japonica, Achillia Millefolium, Cannas, Chrysanthemums, Perennial Coreopsis, Gaillardia Perennis, Cyperus, Lilies and Amaryllis of various kinds; also Gladiolus and Tuberose.

Dahlias may be planted later as a background, and for the front of the border there is nothing better than Carnations.

Natal Fruit Farmers' Union.

WE have received a copy of the Annual Report of the above Union. Although only in the second year of its existence, the Union has done, and is doing, good work. The most of the Report deals with the coast fruit industry, and in that respect the information as to the operations of the Union is extremely satisfactory. Much of this information has to do with the shipping of fruit, time in transit, stowage, ventilation, sizes of packages, detentions, pilfering, etc. The Union-Castle Company, by whose ships the most of the fruit is conveyed, appears, from the correspondence published, to be genuinely desirous to give all reasonable facilities to fruit-shippers. This Company, indeed, went so far as to offer a free return passage to any delegated member of the Union, in order that from personal observation it might be found out in what respects the shipping arrangements were defective, and how they might be improved. The member delegated was

Mr. Vincent Seymour, and his report is interesting and suggestive.

From the remarks of the Vice-President (Mr. J. D. Ballance) we take the following:—" . . . The fruit trade, more especially in the selling and marketing line, is becoming increasingly monopolised by Indians, and in the near future it is not too much to say that they may control the entire trade. When that is the case, it is to be feared that the grower will not have a very pleasant time, when he realises that he is practically in the hands of the Indian."

On the 1st of November last, we notice that the "Scot" started on her Home trip with 535 cases of bananas for the Cape Ports. Over half—278 cases—was shipped by Indians.

The value of fruit exported in 1902 (presumably coast fruit only), is given as:—

By Rail—

9 months, 7,137 tons, £62,696

By Steamers—

12 months, £20,529

In addition, there is the local consumption, estimated at about £5,000.

"From the figures," says the report, "it would appear that there is already an annual production of fruit in Natal to the value of nearly £100,000. This money is spread over a large number of producers, and is of far more value to the community than an equal amount from two or three large sugar estates. At the time of writing this report, there is not enough fruit in the market to meet the demand, and the Industry is in a thoroughly sound and healthy condition."

A Committee of the Union had an interview with Mr. J. H. Smith, the

Railway Commissioner, with regard to such matters as the returning of empties, handling of fruit, shelter of fruit at stations, etc., and are hopeful that benefit may follow.

The Headquarters are at Durban, and most of the subscribers are coast farmers, but these facts should not cause up-country fruit-growers to stand aloof. In an *Ergates'* interview with Mr. F. Symons, Mr. Symons said that all fruit-growers should join the Union. His advice was good. The title of the Society indicates the object of the Society's existence. The Vice-President, Mr. J. D. Ballance, Acutt's Arcade, Durban, is, *pro tem.*, the Secretary of the Union, and from him presumably full information as to terms of subscription, etc., may be obtained.

Gleanings.

The "Hawaiian Planters' Monthly" for April 1903, estimates that the total production of sugar in Hawaii will be about 390,000 tons.

Several cows have died at a homestead in New Zealand through the absorption of lead into the liver and kidney tissues by licking red paint from a house that had been renovated. The linseed oil in the paint lured the animals to death.

The number of packages of honey shipped by the Beekeepers' Association on May 28th to London, states the Jamaica "Daily Telegraph" of May 30th, was 282. It is expected that the next shipment will be twice as large.

It is stated in the "Board of Trade Journal" for April 23rd, that over 1,400,000 tons of raw beet sugar were produced in Germany during the eight months ending March 31st last. Over, 1,900,000 tons were produced during the corresponding period of the previous sugar campaign.

According to information received through the Foreign Office, the area sown with maize in the Argentine Republic this year is about 4,363,000 acres. There appears to be a fair prospect of a good crop, both as regards quantity and quality, and it is estimated that the total yield is likely to amount to about 3,657,000 tons.

According to "Our Western Empire" for May 15th, 1903, "molascut appears to be booming. In 1902, 1,938 cwt. were shipped to Liverpool; this year the figure is already 5,238 cwt., and the import into the United Kingdom for the whole year is estimated to reach 37,000 cwt. The above figures, it may be stated, are from British Guiana alone."

The valuable pedigree Clydesdale stallion, Lord Milner, the property of the Cape Government, died of poisoning through eating oleander leaves. Lord Milner was imported as a two-year-old by the Government for the Agricultural College at Elsenburg. The stallion got out of his stable at Elsenburg in the night, and must have browsed on an oleander shrub before his absence was discovered.

The theory of Professor Koch that cattle tuberculosis cannot be transferred to a human being is reported to have been the subject of legal proceedings in Hamburg recently. A beggar was prosecuted on a charge of vagabondage. His defence was that six months ago, while slaughtering a tuberculous cow, he got some of the virus into a wound in his arm. Since then his arm had been useless. Dr. Lach, of the Hamburg Hospital, confirmed the man's statement, and said that the whole of the right arm was tuberculous. He had performed an operation thereon, and was satisfied that the malady had been caused by inoculation with the virus of tuberculosis. The court acquitted the man.

The Culture of Eucalypts.

By T. R. SIM, F.L.S., Conservator of Forests.

(Continued.)

EUCALYPTUS CAPITELLATA, SMITH.

ONE OF THE STRINGY-BARK TREES.

LIKE all the other true Stringy-barks this tree has a tall more or less unbranched straight stem, and is frequent and satisfactory in its growth in Natal. A tree 23 years old at Wilkinson's Nursery, Maritzburg, has 70 feet height and a diameter of 24 inches. It is unfortunate that none of the Stringy-barks (which include *E. capitellata*, *E. eugenioides*, *E. obliqua*, *E. macrorhyncha*, and *E. Baileyana*) are durable in the ground, though often used for sleepers where they abound naturally in Australia and Tasmania, and from mature material said to last from seven to twelve years. But they are all straight, split easily, saw well, and are useful for many purposes, including house-building and wagon timber, &c. They are all easily cultivated, and grow freely.

EUCALYPTUS CORNUTA, LA BILL.

THE YATE TREE.

A medium-sized tree, inclined naturally to form a branched and bushy crown, and consequently admirably adapted for use in parks, street tree-planting, and shelter belts. It grows rapidly to 30 or 40 feet in height, with a stem diameter of 18 inches if in fairly deep moist soil, but also continues to thrive, though more slowly, in dry hot ground. Mueller states that it occurs also in limestone ground, and thrives even in moist tropical climes, and that its timber, which is very heavy, is preferred in West Australia for the strongest shafts and frames of carts and other work requiring hardness, toughness, and elasticity, and is considered equal to ordinary ash-wood. It is frequent in the Eastern Province of Cape Colony, as at King William's Town, East London, Grahamstown, and Queenstown, but has not been noticed by me in the Western

Province nor in Natal, except one tree in Wilkinson's Town Bush Nursery, Maritzburg. The dwarf variety *E. Lehmanni*, Fr., which is common in Cape Colony but absent from Natal, seldom exceeds 15 feet in height, and has curious large clusters of congested capsules; it makes a very distinct and pretty small tree for a lawn, and is occasionally used as a street tree with good effect where a whole line is of one kind. *E. cornuta* is so apt to branch that it requires to be planted closely and kept pruned if straight timber is desired. As it comes from a country having winter rainfall and a hot dry summer, climatic conditions in Natal are not favourable for its growth, though in the Eastern Province of Cape Colony, where it does well, climatic conditions are similar. Concerning its growth in California, where it is mostly used as a shade tree, McClatchie writes:—"The Yate endures high temperatures, but will not endure heavy frosts. It thrives on the coast and endures the dry hot summers of the interior valleys of California and Arizona, provided its roots are supplied with plenty of water. It endures temperatures of 110 deg. to 116 deg. F., but is injured by minimum temperatures of 23 deg. to 26 deg. F. It prefers a rich moist soil, but will make a fair growth in poor soil. It seems to be well adapted to moist tropical and semi-tropical regions, enduring more rain than many other Eucalypts."

EUCALYPTUS COREMBOSA, SMITH.

THE BLOOD-WOOD TREE.

One of the few Eucalypts which does fairly well in the coast-ward districts of Natal. In South Eastern Australia it is said to grow to a large size, and to produce durable dark-red wood suitable for fence-posts and rails, as not easily set fire to; used also for railway sleepers, &c.,

and resistant to white ants. It is said that the presence of Kino renders the timber unsuitable for lumber, and causes it to make poor fuel, but renders it more valuable for paving, for posts, and for other uses in underground situations. It splits easily. In Wilkinson's Nursery, Maritzburg, a tree about 23 years old has a clean straight bole 60 feet in height and 12 inches diameter.

EUCALYPTUS CORYNOCALYX, F. V.

MUELLER. THE SUGAR GUM.

This species, which in South Australia is a fairly large tree, has not thus far shown any tendency here to exceed medium height, and is usually a flat-crowned tree of 30 to 50 feet in height, and of rather slow growth. Its twigs have a yellowish colour, which makes it a distinct and effective street tree. Not uncommon in King William's Town, Queenstown, &c., a nice plantation of it exists at the Trappists Station at Centocow, Dronk Vlei; and there are nice young trees of it in the Alexandra Park, Pietermaritzburg. It branches freely, and requires to be planted closely to produce single stems. It has an Australian reputation for doing well in hot waterless regions as well as on dry ironstone ridges inland, but here it prefers soil and atmosphere not very dry. It requires thorough protection from stock, as, like *E. Gunnii*, it is readily grazed by cattle and goats. Concerning its timber Mueller states:—"The wood is remarkably heavy, very dense, hard and strong, less liable to warp than that of many other kinds of *Eucalyptus*-wood. It has come into use for fence posts and railway sleepers, naves and felloes. Its durability is attested by the fact that posts set in the ground 15 years showed no sign of decay." And Gill says:—"The wood is hard, dense, and durable, losing but little in seasoning; it weighs when dry generally 65 to 70 lbs. per cubic foot. It is yellowish brown in colour, often showing a handsome wavy grain. It is used for posts, rails, piles, wheelwrights' work, and railway sleepers; also for furniture; selected specimens cut to veneers have proved very effective, while for parquet flooring, in common with several other Australian

timbers, it possesses many serviceable qualifications." In California it has been found to thrive alike on the Pacific coast and in dry inland valleys, and while it endures drought it likes moisture.

EUCALYPTUS CREBRA, F. V. MUELLER.

NARROW-LEAVED IRON-BARK.

The four Iron-barks, *E. paniculata*, *E. crebra*, *E. siderophloia*, and *E. sideroxylon*, are placed by Maiden in the above sequence as their order of importance, and collectively he states concerning them:—"Ironbark is the King of New South Wales hard woods, in fact it is not excelled in any part of the Continent for combined strength and durability. It is extensively used in bridge construction, for railway sleepers, for posts, for naves, spokes, shafts and framing, by the wagon and carriage builders; for large beams in buildings, particularly in stores for heavy goods—in a word, wherever great strength is required. For such purposes as railway-sleepers it will last an indefinite period, and in many cases has to be taken up, not because it shows signs of decay from exposure on the permanent way, or disintegration because of the vibration to which it has been subjected, but because holes have been made in the sleeper by the renewal of bolts and spikes. I have specimens of sleepers which have borne the heaviest traffic of the main line near Sydney for 25 years, and which are as sound as the day they were laid."

E. crebra is less hardy than the others, and thus far has made rather slow growth in Cape Colony, and has not made rapid girth growth in Natal, though many specimens exist with tall clean stems of 60 feet height and 6 to 9 inches diameter as the growth of 10 to 15 years. It is slower growing but less branched than the other Ironbarks, and has been noticed along the coast, and up as far as Maritzburg.

EUCALYPTUS DIVERSICOLOR, F. V.

MUELLER. THE KARRI.

An enormous tree, belonging to the southern and coast-ward portions of West Australia, where it occupies mostly deep

chocolate and sandy soils. It is easily damaged by frost, and suffers also from extreme drought, especially over a solid rock subsoil, even though at considerable depth, its rapid growth causing a demand for moisture unusual even among *Eucalypts*. It is one of the most ornamental species for park or avenue purposes so long as it retains its lower foliage; it has no distinct leader when young, but eventually forms a grand single bole of straight clean timber unbranched for a long distance up, if grown in forestal espacement. At Tokai Plantation, near Cape Town, it is making splendid trunks on the steep mountain side; at King William's Town there are fine old trees in the cemetery, and in Maritzburg there are several good trees, two branched trees 23 years old in Wilkinson's Nursery being 80 feet height by 2 feet diameter, while five others are 90 feet height by 14 inches diameter. It is one of the most promising species for culture on a commercial scale below 3,000 feet altitude, especially where under the influences of mists and sea breezes, but not quite on the coast, and it should not be used on shallow shale or in Thorn country. Its foliage being horizontal, it gives denser canopy than other *Eucalypts*; it also produces and sheds more leaves than other kinds, and so forms a humus layer of top soil; and if planted reasonably closely it soon kills out all weeds by its density of cover. Seedlings are easily raised and easily transplanted when small, but are more subject to damage by frost than any other *Eucalypt*. It has proved satisfactory in deep alluvial soil and humid atmosphere in Ceylon, California, and Algeria, and is subject to a heavy winter rainfall in its native habitat, where it attains a height of 400 feet.

The timber is imported in quantity into Natal, Cape Colony, and the Transvaal for planks, beams, boards, &c., mostly for use under cover and for mining purposes of a temporary nature, its durability in contact with the soil or when exposed to the weather being somewhat doubtful. Mueller states:—"Furnishes good timber for building, even for masts, likewise for planks; also valuable for shafts, spokes, felloes, fence-rails; it is elastic, but not so

easily wrought as that of *E. marginata*. . . . Its strength in transverse strain is equal to English oak, while it is 50 per cent. stronger in regard to vertical crushing strain, according to tests made under the supervision of Mr. Laslett. Admirable for wood-bricks even in cold climes." Maiden gives the same uses for the timber. Karri, Jarrah, and Djatti wood are the three kinds imported by the Natal Government for Railway sleepers, but the Karri will probably not prove durable; while concerning its use for harbour works the Engineer of the Natal Harbour Department reports:—"Karri (*E. diversicolor*) is quickly eaten up below water, but above water it is equally good if not better than Jarrah," and again writing concerning Ironwood (*olea laurifolia*) he states that the latter "cannot, however, be compared for constructing timber wharfage either for resisting the sea-worm with Jarrah, or for durability with Karri above water." Laslett says:—"It will not last between wind and earth, though, as far as is yet known, it resists the action of water." Probably often sold as Jarrah, and being of the same light-red colour not easily distinguished except by the ash left after burning, which is of different colour.

EUCALYPTUS EUGENIODES, SIEBER.

WHITE STRINGYBARK-TREE.

An erect unbranched tree which grows freely and reproduces itself within the mist belts, though also hardy enough for any part of Natal. The seedlings have alternate leaves and are hairy, like those of the closely allied *E. capitellata*, Sm. The timber has valuable qualities, but is not durable in the ground.

EUCALYPTUS FICIFOLIA, F. v. M.

CRIMSON-FLOWERED GUM.

Rather a small tree, seldom over 30 feet in height, and not recommended as a timber tree, but on account of its gorgeous crimson flowers, abundantly produced even on young trees, and which render this species one of the brightest ornamental features in a landscape. It has large fruits similar to those of *E. calo-*

phylla, to which it is closely related. Both these species come from the semi-coast regions of South West Australia, where they are accustomed to heavy winter rainfall, consequently the climatic conditions here are reversed for them. They do well in the winter rainfall of Cape Town, and fairly well even in the summer rainfall of the Eastern Province, but in Natal only one poor tree of *E. ficifolia* is known to me.

EUCALYPTUS GLOBULUS, LA BILL.

TASMANIAN BLUE-GUM.

The timber value of this species was dealt with in a recent article in this *Journal*. In the case of Mr. Raubenheimer's trees, recorded therein, the crop was obtained from seeds sown where they were to remain and watered until germination was secured, and a start made. That was in Cape Colony, but a similar treatment was adopted in Natal on the beautiful estate of Jos. Baynes, Esq., M.L.A., at Nel's Rust, where this and other species of *Eucalypts* were sown along the south side of a long soil bank having an irrigation furrow close at hand, and with successful result. On the same estate some of the older trees, which are probably the best in Natal, are 200 feet in height and 30 inches diameter, while others with less height have greater girth. *E. globulus* enjoys best a cool equable climate, with abundant water supply; the water preferably should not be stagnant, but is best as soakage from perpetual stream; the species, however, succeeds on any deep soil, even without irrigation, but fails in the humid coast districts both in Natal and in India. Its power of transpiration is very great, and it has been employed in many parts of the world to dry up what were formerly malarial swamps.

EUCALYPTUS GOMPHOCEPHALA, DE

CAND. THE TOOART.

A large tree from South West Australia, where it enjoys winter rainfall and calcareous coast soil. On the barren driftsands of Port Elizabeth and on the dunes at East London it has made more suc-

cessful growth than any other gum; and in the Town Bush Valley, Maritzburg, the only tree seen in Natal is a fine specimen, 70 feet high, 23 years old. The timber is recommended for great strength and toughness, and is said to be durable. For the coast this species has high qualifications where rainfall is more or less regular.

EUCALYPTUS GONIOCALYX, F. V. M.

BASTARD BOX-TREE

A rare tree in Natal, but one which should do well, especially towards the coast. Furnishes durable sleeper timber, valuable also for wagon-work and general purposes.

EUCALYPTUS GUNNII, J. HOOKER.

CIDER GUM.

One of the very hardy species, enduring hard dry frosts better than most. It makes a tall clean-stemmed tree, with abundant dark-green wavy foliage, and is consequently a good feature in upland ornamental tree planting. Mueller states it "supplies a strong useful timber," but its durability is doubtful, so it is not recommended for use in the ground. Frequent in Kaffraria and not uncommon in Natal, usually doing well.

EUCALYPTUS HEMIPHILLOIA, F. V. M.

GREY BOX.

A tall tree of fairly rapid growth and rather sparse foliage. Frequent in Natal, where it does well, as might be expected since it comes from a similar climate. Does well also in Kaffraria especially in or near the Yellow-wood belt and coastward. Mueller states:—"Regarded as a timber tree of great excellence. It is famous for the hardness and toughness of its timber, which is used for railway-sleepers, telegraph poles, shafts, spokes, mauls, plough-beams, and similar utensils; also excellent for fuel." Gill says:—"A most valuable timber, dense, hard, and of great strength, with close interlocked grain; it is admirably suited for many and varied uses, such as naves, felloes, shafts, spokes, railway-sleepers, fence

posts and rails, and mauls. When seasoned, weighs from 60 to 70 lbs. per cubic foot." Maiden states:—"It is used in the Colonies for the naves of wheels and heavy framing, and for the cogs of wheels, large screws, mauls, handles, shafts, poles of drays, &c., which require a tough wood for their manufacture. In Victoria it is in high repute for railway-sleepers, and in that Colony and our own for piles, gir-

ders, &c. It can be recommended with confidence to railway-carriage builders and others who require a strong durable timber for framing, &c."

Messrs. Merryweather & Sons, wagon-builders, Pietermaritzburg, supplied for identification flowering specimens of this as a gum, which, they state, gives splendid useful timber.

(To be Continued.)

Farming, Then and Now.

INTERVIEW WITH MR. THOMAS STEAD, J.P.

By ERGATES.

MR. T. STEAD, of New Leeds, Thornville Junction, in his knowledge of farming in this Colony, retrospective, present, and prospective, if I may say so, has but few compeers. The future conditions of agriculture, steam or electric traction power, and the rest, he discusses with as much zest as he discourses upon the difficulties surmounted in the early days.

RETROSPECTIVE.

Back to 1865 the years must be rolled to see him arriving on his farm. The farm was then but a couple of hundred acres obtained on a lease of 25 years from the late Mr. Vanderplank. Now the farm is his own, with the addition of some 1,200 acres he has bought adjacent. Mr. Vanderplank, whose estate was immense, was a good landlord, in so far that he was ready to rent his land, but in the matter of declining to give compensation for buildings or plantations at the termination of the leases he greatly retarded the proper progress of his big domain. Mr. Stead, with the regard for Home associations, common to colonists throughout the Empire, called his farm New Leeds. Arriving in the month of August the first thing to do was to put up a house. He had no time for brick-making, and adopted a plan, which to me, at any rate, was

novel. He built of sods, not cut with the spade in the usual manner, but "ploughed." The strips of soil were cut with spades into lengths, and each length before being put into place was soaked for a moment in water. The house existed, and in perfect preservation, until it was recently pulled down. Neighbours were few and far between. Occasionally a lion or leopard would pay a visit. One night there was a panic among the horses in the kraal, one mare was killed and one had her shoulder badly torn, and on another night the scratching of a powerful animal was heard on the thatched roof. Mr. Stead went outside the house and saw a leopard (or tiger, as this animal is commonly called in South Africa), which immediately sprang to the ground. The alarm was mutual. Mr. Stead returned for a lantern, and without any clear object in view, followed the marauder into a field of mealies. Suddenly, however, he heard the beast returning towards him. He gave up the hunt and imagined he was the hunted. The leopard soon overtook him, but to his satisfaction passed by. The next day Mr. Stead went to Maritzburg to buy a gun.

COTTON.

Cotton was one of his earliest crops. He planted the New Orleans and South

Sea Islands varieties. In 1868 he had a splendid looking crop, but it was knocked flat by a fearful hail storm. In Maritzburg, the 1868 hail storm was long remembered. He did not try cotton again. Owing to the cessation of the United States' war the price fell so low as to make the growing of it unremunerative.

MEALIES.

To get ready money, it was then thought best to put in mealies, but the money was not much, and it often, small as it was, was not very ready. "At the end of the Sixties," said Mr. Stead "about 2s 6d or 3s was the price per muid in Maritzburg. Once I took two loads to Durban, and for a day did my best to find a purchaser. On the evening of the second day I met Mr. — Saville, of the then firm of Messrs Saville Bros., and he asked me why I was looking so 'down.' I told him, and he said that sooner than take the mealies back to the farm again he would give me 4s a muid. I jumped at the offer, and I was fortunate in getting loads for Maritzburg at 2s per cwt—which was a high rate. Good bullocks were then cheap, the epidemic of lung-sickness had passed, and they could be picked at £5 a head."

FORAGE.

"In about 1870 I went in for forage—Cape, of course—and did pretty well with it. In many parts it rusted badly, but mine kept fairly clean. My crops were heavy. I remember a field of 25 acres from which it was necessary to carry a large portion on to the grass in order to dry it. The price was generally about 2s, but sometimes it touched 3s. I supplied a crop to Curry's Hotel, forty miles away, at 4s. Sometimes the crop was so good that I threshed it for seed."

MARKET FLUCTUATIONS.

"Yes, the life of an agricultural farmer in those days was a hard struggle for existence. Sudden fluctuations were constant: there was one

rise which I shall never forget. It was in 1872, I think, that my brother took a load of thirty muids of mealies to Mr. Mason, of Alice Mills, Maritzburg. We had heard no town news for about three weeks, and the top price my brother expected was 3s. He had a promisory note falling due and was in an anxious frame of mind. Mr. Mason put thirty sovereigns on the table. My brother thought Mr. Mason was playing a practical joke, and protested. Mr. Mason said he would not give more, and for several minutes they were at cross purposes. My brother's elation at getting 20s a muid, with the offer to take the rest of the crop at the same price, while he was expecting at the best to get 3s. I shall not attempt to describe. Mealies, as a matter of fact, went up at that time to 30s, and it was that happy turn which put most of us firmly on our feet and saved others from going under."

POTATOES.

"About the same time we grew splendid crops of potatoes—red roughs. But potatoes were unsaleable. On one occasion I got an offer of 1s 1d per muid of 200lbs. for my crop, and several neighbours wished to join in with me at that price. Coming back from Maritzburg one day I met a Mr. Hayes, whom I slightly knew, engaged in off-loading potatoes into the river at Camp Drift. He had failed to sell them in Maritzburg, and said there was no sense in hauling them back to the farm."

REDWATER.

Redwater came into the Colony in 1874. It came when the first Madagascar oxen were imported, and I have no doubt that those animals introduced it. I see that my friend, Mr. James King, has expressed the same view to you. The very immunity that those beasts enjoy from their day of landing goes a long way to confirm that view. Redwater became very bad all through this district. I remember one Sunday when no fewer than nine oxen died from that disease out of a span which had

been to Maritzburg a week before. We used to try all kinds of remedies, European and native, and I am sure that not a few beasts were poisoned by them. At the request of a Maritzburg man I ran twelve cows for him. One day I received some medicine from him, and he wrote asking that I would give it immediately as it was a safe and certain preventive. On the day following only two were alive. There are belts of Redwater country, and it is risky bringing outside cattle into them. Eleven years ago I bought seven head of Pondo cattle; within a fortnight all were dead.

TOBACCO.

About 1875 I showed to a Maritzburg store a sample of tobacco I had grown, and I got a promise of 6d per lb. for what I liked to grow. I put in five acres and reaped a splendid crop. But when the would-be purchaser heard of the quantity I had for disposal he was appalled and cried off. I wrote to a manufacturer in America for advice about curing, etc., and he kindly replied. He said that the sample sent, as tobacco, was excellent, but that it required manufacturing, and he advised that several farmers should club together and get a competent man to instruct in the growing, and cure the crops of the syndicate. Although a guarantee of only £200 a year for the man was wanted, yet the sum was then beyond our means. My heavy crop hung on my hands for three years, when some Basutos, from the Transvaal, I had working here, suggested that I should make it into rolls, and sell it as if it had passed through Boer hands. They supported the opinion I already had as to its goodness. Accustomed to the work they soon twisted it into the well known rolls. The tobacco was taken to Maritzburg and was sold at 1s per lb. I should like to see this industry started here in a proper way. There would not now be much difficulty in getting a guarantee for a few hundreds.

FERTILISERS.

"Until about ten years ago none of us gave any practical attention to the ques-

tion of fertilisers. It was about that time that I had a conversation with Mr. R. H. Pechey about bone dust. What he said so impressed me that I ordered enough for a field of thirty acres which was giving only two or three muids to the acre. My neighbours thought I was wantonly throwing away good money, and some of them went so far as to say that the bone-dust would ruin and burn up the soil. It was a satisfaction for me to see their astonishment when the field gave a crop of close on ten muids to the acre. Everywhere in this district fertilisers are now being largely used. Although the use of fertilisers ran with his personal interest, yet the fact should not be lost sight of that their introduction to the farmers was due to Mr. Pechey. He gave away small quantities for experiment to those who applied, and a couple of trees in the Market Square which he treated were a splendid demonstration of the benefit to be derived from what he recommended. Of course, we do not now confine ourselves to bone dust; we mix our chemicals, and on one field my son conducts special experiments. Mr. Stead has some 300 acres in cultivation, and the average yield in mealies is ten muids to the acre. Previous to the use of fertilisers, the return was only four to five muids."

EFFECT OF RAINFALL.

In answer to some questions about the soil, Mr. Stead replied:—"The land for the first few years gave a crop of about ten muids of mealies to the acre, and even thrown broadcast on the sod a return of seven muids might be counted on. Now-a-days crops are much poorer. New soil in first class tilth will produce not more than three or four muids. This, apparently, proves that climate—then we used to have a thunderstorm every afternoon in summer—has a lot to do with mealie growing."

WATTLES.

The wattle tree, Mr. Stead informed me, was first grown in the Colony at Camperdown. The seed was brought from Australia by a brother of the late M. Vanderplank.

CALF REARING.

Having remarked upon the thriving appearance of Mr. Stead's last year's calves, he said, "Yea, they are doing well, but formerly I had nothing but disappointment with them. I used to lose nearly half every year, and this year I have lost only two out of twenty-five. I put the success down to artificial food; we use Bibby's Calf Food. Next year we are going in for hand-rearing; the days for the old system, or rather absense of system, are gone by. Mr. G. D. Alexander's pamphlet on hand-rearing is excellent in all respects, and we shall follow on the lines he lays down. The example at Nel's Rust in calf-rearing should give an impulse throughout the Colony to dairy work and cattle-breeding."

THE RESERVOIR.

On several occasions reference to the badness of water at homesteads and the evils arising from the use of such water have been made in the *Journal*, and it was with pleasure I noticed that Mr. Stead was among those farmers who give consideration to this most important matter. The water is brought by pipe from a spring-fed reservoir about a mile and a half distant. There are taps throughout the house, and at the stable, cow sheds, etc.

THE DAM.

Last year owing to the continued drought, Mr. Stead decided on making a dam. The streamlet which feeds it, for many years ran strongly, but of late even cattle found difficulty in drinking from it. The dam gives them a good supply, and it enables the irrigating of several acres chiefly devoted to cabbages, cauliflowers, peas, etc. The dam is built of sacks of puddled clay, clay well puddled being rammed between them. The pug mill, very simple yet effective, was made by Mr. Stead.

DISC PLOUGHS.

In the disc plough Mr. Stead is a great believer. We had a look at one at work—sold by Messrs. Malcomess—and un-

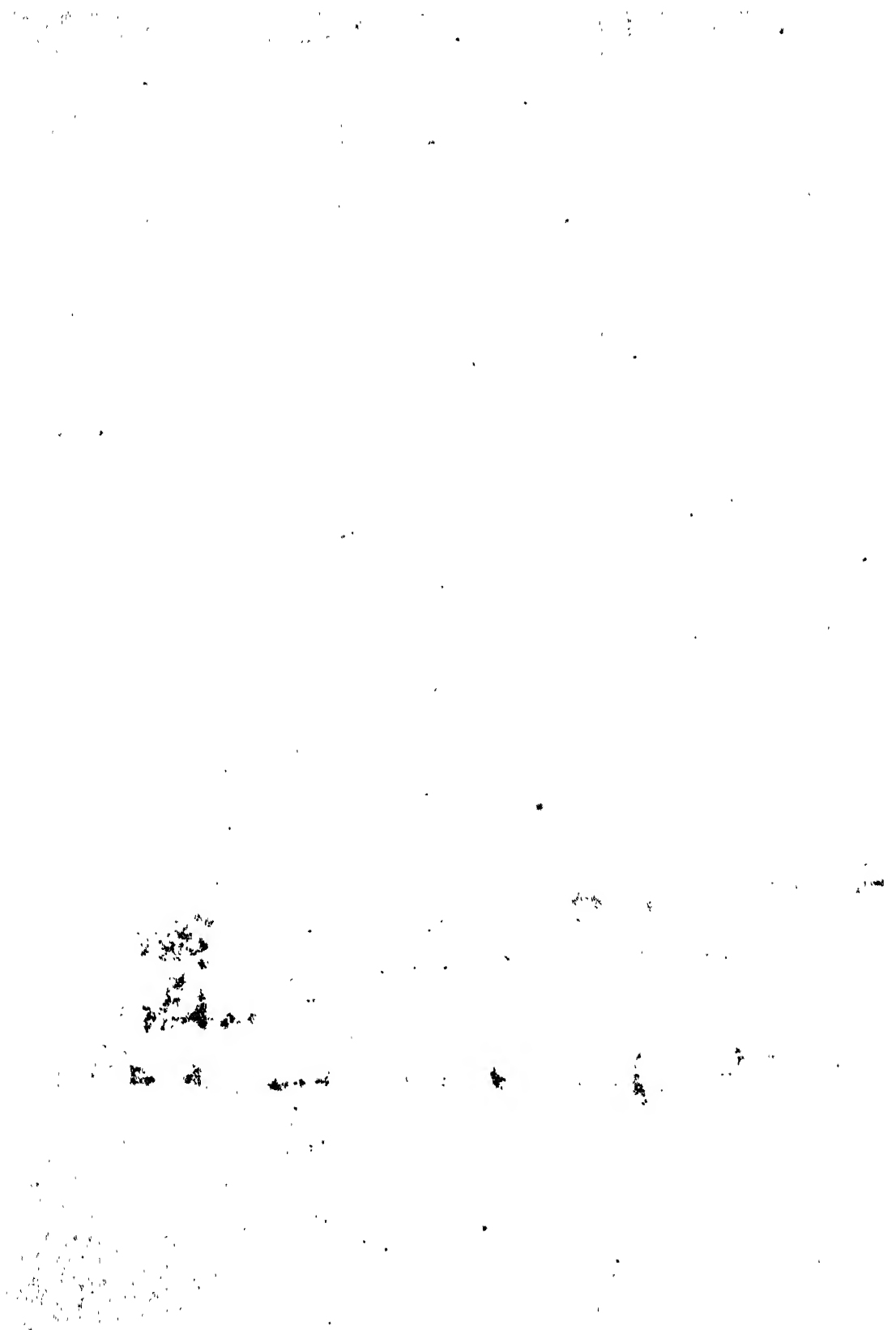
doubtedly it was doing excellent work. It was cutting to a depth of fully six inches, the soil was being well pulverised, and the whole was being thoroughly churned. "Our land in this district," said Mr. Stead, "is hard, very hard, until heavy rains have saturated it, and for planting mealies our time is very short. Between the 20th of November and the 20th of December we should get in our crops. During that month we have been accustomed to having three three-furrow ploughs going hard without interruption. Now, the pull of the disc plough comes in here:—We can easily get our land in good tilth with the disc plough before the 20th of November. The disc plough in this district will mean in future a greater acreage under crops."

TRACTION ENGINES.

Mr. Stead has practically made up his mind to purchase a traction engine for ploughing, etc.; the question has now become which one to buy. He argues, "my soil in the spring is hard and can bear a traction engine about as well as an ordinary road, and with disc ploughs the engine ought to do a large amount of work. As to the price, why, two spans of oxen should pay for one. Cattle, too, are risky. What if the Rhodesian disease should make a clean sweep of them! Then a traction engine should be useful for hauling crops to the railway or other places for delivery, and also for lots of farm work. With such advantages and under such conditions, Mr. Stead is of opinion that a traction engine should be considered a profitable adjunct to the mechanical plant of an agricultural farm.

NATAL FARMERS.

Mr. Stead, as will be seen by what I have already written, is well entitled to be classed among the progressive farmers of the Colony. It can, therefore, be imagined that when deciding on a visit to the Old Country four years ago that he looked forward with eagerness to what he believed he would commonly see there in advanced farming. In those parts which he visited there was plenty of high class scientific farming among the wealthy, but





DAM AT FARM OF MR. THOS. STEAD. J.P.

(See Interview.)

what struck him most was the backwardness, or in other words, the ignorance, among the small farmers generally. It seemed to him inconceivable that men who had farmed all their lives, men descended from generations of farmers could be so out of touch with the advances in agriculture. In South Wales and Gloucestershire he found men, to his amazement, cutting grass for hay with the old scythe. Some had mowing machines, but machines which in Natal would be thrown on the scrap heap. On more than one occasion he pointed out that stubble enough was being left to pay in one year for a good modern machine, but all that was elicited was a sort of wonder that a South African Colonist should know anything at all about mowing machines. The hay was being taken to the stacks in carts or wagons instead of in the cheap and speedy way of dragging it in slips. "The scufflers," he continued, "and many of the implements which I saw, were quite out of date. At a local show a potato-planter was on exhibition, and

hardly one in a hundred appeared to know what it was for. I am now speaking of average small farmers who farm for profit and who are largely representative of the home farming industry. It makes me 'tired' to hear men of this stamp who come to Natal when they speak in a contemptuous manner of Natal farmers. I also feel much the same irritation when a certain bouncing class of Australians, Canadians, and others make comparisons, generally stupid, and betraying complete ignorance of our local conditions. Natal farmers, I am convinced, in knowledge of implements, and fertilisers, and in intelligence, and enterprise take a high position the nonsense that townsmen talk and write about them notwithstanding. I am also of the opinion that Natal farmers will keep that position, and for these reasons. Their conditions make them self-reliant, and independent, and they know there is lots about which they are ignorant, and practically all of them are always keenly on the look-out for something new to learn."

Veterinary Departmental Report for July, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of July, 1903:—

Scab.—Forty fresh outbreaks have occurred during the month. Klip River County, 8; Weenen County, 17; Umvoti County, 3; Umgeni Division, 1; Lion's River Division, 1; Impendhle Division, 3; Utrecht Division 1; Vryheid Division 5; Zululand 1.

Lungsickness.—Seven fresh outbreaks have occurred during the month. Klip River County, 2; Umlazi Division, 1; Utrecht Division, 1; Vryheid Division, 1; Zululand, 2.

Anthrax.—Three deaths reported in Klip River Division.

Glanders.—Six clinical cases have been destroyed during the month, and 23 which reacted to mallein.

Rinderpest.—A fresh outbreak occurred in Natal at Sans Souci, Estcourt Division—one death from Rinderpest occurred. These cattle had Rinderpest amongst them three months previously, and were then inoculated with glycerinated bile. In the present outbreak defibrinated blood was used from salted animals Mr. Groom had running in his troop. The defibrinated blood checked the disease, and had beneficial results on those affected, but, unfortunately, it was the means of communicating Redwater to a number of the animals treated, and I understand that four deaths have occurred from Redwater. This is most regrettable, and in this case the treatment has had more disastrous effects than the disease itself. As you are aware, I have pointed out the danger of

using the blood of one animal on another in this country, but it must be admitted that this case at Sans Souci is most exceptional, as it is rare that the blood taken from animals running on the same veld, and in the same herd, does produce such results, the local infection being equal. I believe it has always been impressed upon owners that the temperatures of animals bled should be normal at the time of bleeding, but I am given to understand that one animal bled by the owner had a temperature above normal at the time of bleeding. It is possible that in this animal the high temperature may have been due to a modified attack of Redwater.

The disease in Zululand is not very prevalent at present. There are still, however, isolated cases in most of the districts. It is most prevalent in the Nkandhla Districts, and first outbreaks have occurred in the Nongoma and Hlabisa Districts.

Rhodesian Tick Fever.—There have been no fresh cases at Ingwavuma since the 9th July. The cattle in the vicinity are still being dressed periodically for ticks. Our border from Volksrust to the sea is being efficiently guarded against the introduction of cattle into our Colony, and those attempting to evade the restrictions are being suitably dealt with. The above is being done at considerable expense, but it must be borne in mind that this Border is a very long one, and the country in parts very broken.

I put up reports of D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT,
P.V. Surgeon.

13th August, 1903.

MOOI RIVER.—D.V.S. VERNEY.

Rinderpest.—Quite unexpectedly this disease has again broken out on the farm Sans Souci, the property of Mr. Groom. The same herd was affected about three months previous to this last outbreak, when only one animal showed genuine clinical symptoms of Rinderpest and recovered. The rest of the herd was

promptly inoculated with glycerinated Bile, and except for three more animals showing high temperatures no more cases occurred.

The disease evinced itself in a much more virulent type this time, three animals showing well marked Rinderpest; one of which promptly died—the ulcerated mouths in these cases were particularly bad. Altogether, there have now been six cases of Rinderpest; four have completely recovered, one died, and another was in such a debilitated condition that it was thought best to destroy it so as to prevent an unnecessary extension of the quarantine period. I inoculated the whole herd at once with defibrinated blood obtained from four animals; one animal was the ox that recovered three months previously, the remaining three were animals that were known to have salted in 1897, and one of them was a cow I had in the Serum Camp at Nottingham Road, when Rinderpest was rampant throughout the country. The blood of these animals was all mixed previous to use, and their action appears to have been everything that was desired. I at once inoculated these animals with 100 c.c. of virulent blood, and on the 18th day after this inoculation, the herd was again inoculated. It would have been better, I think, if the whole herd at this second inoculation could have been inoculated with 1 c.c. of virulent blood as well as the serum, but there was then no virulent blood available, so that was out of the question. I think, under the circumstances, it will be as well to inoculate the herd a third time. In reviewing this outbreak, the question that occurs to one is, what was responsible for this outbreak? The popular idea is that the previous bile inoculation was the causal agent, but, I think, this is quite erroneous. In the absence of any other Rinderpest within 100 miles of Sans Souci, I still adhere to the suggestion I put forth in the previous Hlatikulu outbreak, that it is most probable that the recovered animal was responsible for the disease breaking out anew, and I

think it is quite rational to suppose that a previously affected Rinderpest animal may have some sore or ulcer in some part of the intestinal tract that has not quite healed up and has broken down under the influence of some other irritant in the digestive canal. After the second inoculation, some animals developed red-water, which again illustrates how careful one should be in using defibrinated blood for inoculation. The animals employed to supply the blood were taken from animals out of the affected herd, but unfortunately, the important rule of *never* bleeding an animal unless showing an absolute normal temperature was not adhered to.

Vegetable Poisoning.—There have been quite a large number of cases of vegetable poisoning in cattle this month, and nearly all the cases that have come under my notice appear to have been caused by poisons obtained from mealie fields.

DURBAN.—D.V.S. AMOS.

The importations have been remarkably small during the month, and are composed as follows:—

Horses ...	448
Dogs	23
Mules	12
Sheep	6
Cows	5
Bulls	2

Total importations 496

The horses (excepting three from England) came from Australia, and were a good shipment of remounts for the South African Constabulary. The dogs came chiefly from England, and many were well bred dogs imported for stud purposes. Some were landed in transit for the Transvaal. The quarantine for dogs at the compound is now completed, and dogs arriving without certificates are now dealt with satisfactorily.

The importations, as you will see, are the smallest in number for some years, and is due to the closing of the Argentine ports and the existing embargo on

Australian, Indian, and Coast Cattle. The importation of Madagascar Cattle is also at a standstill, first on account of the time of year, and secondly on account of the number still in the market here to be sold. Large fatalities have recently occurred in the latter, I understand.

Lungsickness.—One fresh outbreak occurred at New Germany, and is now quarantined together with another herd that has been inoculated in the vicinity.

Dog-poisoning.—A serious case of this occurred at Stamford Hill. I was called on to make a *post mortem* on a valuable fox terrier that died suddenly the night before. As the animal was in very good health, the death was suspicious of poisoning. The stomach was found to contain a quantity of fresh mince meat, and as the meat was uncooked, the cause was traced to a butcher in the locality who admitted on police enquiries to have put down this mince meat poisoned with strychnine. The next day I made four more *post mortems*, and in all the stomachs I found the poisoned mince meat. Altogether twelve dogs in the district were killed, and eight more recovered after being seriously ill. Proceedings against this man are now being instituted by the police.

All ships containing fodder arriving from the Argentine have only been allowed to enter the harbour after the necessary certificates have been lodged with me, and all steamers that arrive with horses or mules are examined now in the outer anchorage prior to their entering the port.

GREYTOWN.—D.V.S. CORDY.

Scab.—Three fresh outbreaks occurred during the month.

Lungsickness.—None.

Glanders.—A thoroughbred filly, belonging to Mr. Duckham, of Greytown, showing clinical lesions of Farcy was destroyed. Two others which had been in contact were tested with mallein but gave no reaction.

Rinderpest.—The quarantine in the Tugela Valley was raised during the early part of the month. Notwithstanding the amount of trouble the suppression of this outbreak caused, the restrictions were no sooner raised than a Native brought half-a-dozen head of cattle through the Tugela from Zululand during the night. The native guards on the river traced the cattle which were at once sent back over the river. I am glad to say this Native will be unable to repeat the offence for three months, as, being unable to pay the fine imposed, the Magistrate decreed that he should remain in gaol for that length of time.

Quarter-evil.—Thirteen cases were reported from different parts of the District.

Heart-water was fairly prevalent among sheep in the Western Umvoti Division.

Gall-sickness was responsible for several deaths in the Krantzkop and Eastern Umvoti Divisions.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—I have to report two outbreaks of this disease. One in Utrecht Division and the other in Dundee. The Dundee case is a doubtful one. It was reported as lungsickness to the Stock Inspector, but the carcass had been destroyed before his arrival. One further outbreak has occurred in this herd. In the Utrecht outbreak two deaths have occurred. The source of infection in this case is still under investigation. The herd has been inoculated.

Scab.—Eight outbreaks, viz.:—Newcastle, 4; Dundee, 3; Utrecht, 1.

Mange.—In Goats, five outbreaks; horses, ten.

Glanders.—I have had to destroy a mule and two horses affected with this disease at de Jager's Drift. The mule shewed clinical symptoms of both Glanders and Farcy, and the two horses reacted to mallein. Another outbreak occurred on the farm Waterfall, near Utrecht. This case also shewed marked

clinical symptoms. The only other horse on this farm reacted to mallein, and was also consequently destroyed.

Redwater.—Two imported bulls, the property of Mr. W. L. Oldacre, Broadfields, Dannhauser, were both attacked with the disease during the early and middle portion of the month, and although one animal had a very narrow escape from death, and was left in a very weak condition, both have now apparently recovered and are doing well.

IXOPO.—D.V.S. POWER.

Scab.—No fresh outbreak during the month in the Ixopo and Polela divisions. Ixopo division is now free from the disease, the last license having being raised on the 31st.

Lungsickness.—Nil.

Glanders.—Nil.

Quarter-evil.—Two outbreaks of this disease occurred during the month, and in each case the remaining young stock were immediately inoculated, and with good results. During the past few months cases have cropped up in different parts of the district. This being so at this time of the year, it might be reasonable to prophesy more of the disease than usual in the coming spring and autumn; anyway farmers would do well by inoculating early; by this I mean, of course, farmers on known infected farms. Stock on the whole are very healthy.

HOWICK.—D.V.S. WEBB.

All classes of stock appear to have kept particularly healthy during the month. There are three flocks of sheep under license for Scab in the Lion's River Division, and four in the Impendhile; in each instance the infection is very slight.

I visited three centres in my district to examine horses for Artillery purposes, required by the Volunteer Department. This class of horse is apparently very scarce; very few were brought up, and only five were purchased.

I received complaints during the early part of the month about natives allowing their horses infected with mange to wander about, especially in the Nottingham Town lands. The police have now obtained the names of the owners of these horses, and the Stock Inspector has been round and had them isolated and seen that they were properly dressed for the disease. The natives have been warned that if they break the quarantine, proceedings will be taken against them.

NEWCASTLE.—D.V.S. O'NEIL.

Scab.—Several fresh outbreaks have occurred during the month, but none of a serious nature.

Lungsickness.—One fresh outbreak is reported; the animal in question died, and on autopsy revealed what is called black lungsickness, and the herd has been put under license.

Glanders.—Three outbreaks occurred and all the animals were destroyed, and those in contact were isolated and tested.

Rinderpest.—Nil.

Anthrax.—Three deaths occurred.

Gallsickness is responsible for the loss of two head.

Redwater carried off two head of oxen.

Mange still exists amongst horses in the district, and every precaution is taken to eradicate same.

VERULAM.—D.V.S. SHARPE.

Scab.—There are still four flocks under license.

Lungsickness.—One herd in the Ndwedwe location is still under license.

Glanders.—I have been very busy this month testing horses and mules for this disease. Early in the month, as a result of coming across a mule showing clinical symptoms, I went through a stable of 122 mules and 18 horses, and of these 8 mules and six horses reacted and were destroyed. Altogether I have tested 122 mules and 26 horses, 16 animals reacting.

Rinderpest.—None.

General.—With the exception of a few deaths from Gallsickness and

Quarter-evil, as my schedule of deaths for the month shows, nothing of any consequence has occurred among stock, which, on the whole, are very healthy. I have had two cases of Biliary Fever, but they have both recovered. On the 31st, I was called urgently to Lower Umkomaas to see a horse badly injured by barbed wire. When I arrived I found that two of the extensor muscles of the near fore limb were completely severed and the bone exposed, and after a consultation with the owner, we decided to destroy the horse. Stock appears to be in good health though the country is very dry indeed.

MARITZBURG.—D.V.S. FYRTH.

Scab.—No scab exists in the City and Upper Umkomanzi Divisions. In the Uingeni one outbreak occurred in the Zwaartkop Location, affecting two flocks. The native owner of one flock, which affected the flock of an adjoining European farmer, was, I am pleased to state, fined £20 for contravention of the Scab Act. This was the fourth prosecution against him.

Lungsickness.—No cases exist in either of the divisions.

Glanders.—I have not had any cases brought to my notice this month.

General.—There are a few severe cases of mange amongst Natives' horses in the Zwaartkop Location, and they have been placed under the strictest isolation till cured. Stock generally is healthy, although, on account of scarcity of grass, some cattle are in poor condition.

Mr. Hosking, of Byrne, has lost seven head of cattle from the same disease which killed his cattle last year. I have heard of no further deaths since they were removed from the mealie fields on to higher grass land.

VRYHEID.—D.V.S. CROLE.

Rinderpest.—Early in the month there were a few fresh cases, but the disease gave way before prompt and energetic suppressive measures. About the 10th instant, a native from the Transvaal (Piet

Retief) surreptitiously crossed the Pongola during the night and managed to smuggle six head of cattle about 16 miles inland. These cattle broke out with rinderpest and three died: I shot the other three. The thorough and careful precautions instituted will, I hope, prove effective in circumscribing this outbreak.

Lungsickness.—The working of the Natal Stock Laws having been persistently explained to the farmers, there is now much less trouble with this and other contagious diseases, though, of course, the inadequate quarantine period and old "Lungers" still cause a good deal of mischief.

Rhodesian Redwater (Coast Tick Fever).—The latest authentic accounts speak of this scourge as receding from, rather than advancing on our northern border. Quite lately it was reported to have broken out near the Magdoos, but on investigation at the site of the outbreak, I found it clearly to be rinderpest. Further, I am rather inclined to the

opinion that panic and ignorance have magnified many cases of rinderpest across the border and in Swaziland into cases of the new disease. I doubt whether coast tick fever will invade the new territory at this stage of the season. Every possible precaution has, of course, been taken to hinder its advance.

Equine Mange.—I found this highly contagious affection to be rife amongst the horses of the Natal Border Police early this month. There were about 140 cases in various stages.

Glanders.—Two owners of horses which showed clinical symptoms were prosecuted and fined. Unfortunately there exists a rooted idea in the minds of a certain class of owners that nine-tenths of such cases will recover if given a chance.

Tuberculosis.—Cases of this disease have existed amongst Madagascar oxen.

General.—A few cases of Quarter-civil, Tulip-poisoning, Scab, and Snake-bite have been brought to my notice.

Dam Making.

THE following practical and interesting letters are extracted from the *Cape Agricultural Journal*:—

Mr. W. B. Hobson Poortje, Aberdeen Road, Cape Colony, writes as follows:—

I notice that one of your correspondents is asking for hints and advice on dam making, and also that you are asking all those who have the *real* development of the country at heart to send in to the *Journal* the result of their experience.

The subject of dam making is such a very wide one, and the conditions existing in the different parts of the country so varied, that I will confine my few remarks and observations to dam making in the Karroo or the Midlands, roughly speaking.

I wish it to be understood that all remarks in this letter apply only to the Midlands, as I have not had experience in shifting earth in other parts of the country, and also that this article will

deal only with dams for stock-drinking purposes, as the space in a short paper like this is too limited to deal with large dams for irrigation purposes.

My experience has gone to prove that when you are going to make a dam for conserving water for stock-drinking purposes only you must not make it across a river or any large sluit, for the reason that (however careful you may be) in a few years your dam will be silted up.

The best plan is to select a wide open valley; one well covered with herbage for preference. The silt dam has to fill first and then overflow into the proper dam. The overflow of the proper dam is at the intake, so that when full and during heavy floods all the surplus water flows *past* the dam—thus reducing your chance of catching silt almost to a minimum.

In constructing a stock-drinking dam the two principal objects to have in view

are to avoid silt and evaporation as much as possible.

These two greatest drawbacks in dam-making can best be overcome by making your dam with a bank on all sides of the water, and also making the pit of the dam as deep as possible.

It will be found that the bank keeps the water from the action of the wind, one of the most powerful evaporators we have, and also that the depth of water keeps the surface cool and below evaporating point. The point about keeping the water from the action of the wind is a most important one, as it will be found that a dam with an exposed surface loses more water in one windy day than the cattle can drink in a month.

Now having decided on the site, the shape, and depth of your dam, the next question is, which is the cheapest way to shift the earth to make the embankment. There are a great many ways of shifting earth, and different localities and soils require different methods of working, but I will make bold to say that the wheel scraper and plough method is the cheapest and quickest method within the reach of the average farmer to-day.

My experience has gone to prove that the No. 3 Wheel Scraper (Haslup's compressed bowl) is the most economical and the easiest to work, and can be procured in almost any town. Messrs. Howard and Farrar, of Port Elizabeth, were selling a very superior machine with dust proof axles and all the modern improvements.

The plough we use to plough hard ground with is the No. 99 Syracuse contractor's plough. We generally use the ordinary Africander hillside or a J plough for ordinary soils, but when the ground is hard and stumpy it pays best to use the No. 99, which is absolutely unbreakable.

Fourteen good oxen are sufficient to pull the No. 99, and 8 oxen are sufficient to pull No. 3 Scraper.

The most economical way of working is to have three scrapers running at once, as one man can fill three all day long on

a moderately long run, and one man can remain on the bank to tip them. If bullocks are scarce a capital plan is to put only four in each scraper and have a team of six on the ground to hitch on to each scraper for filling purposes. The oxen very soon get used to it and there is very little delay. In starting your bank you should plough the site of the bank so that the loose earth can bind and prevent leakage.

In putting in the first layer or foundation, say 3 feet high, the old fashioned slip-block can be used with very great advantage, but it does not pay to use when the ground has to be shifted more than 100 feet or when the bank gets higher than 6 feet, and at any time it is more tiring to the bullocks.

In starting a bank, to work a wheel-scraper you must be sure and start your bottom layer wide enough; in fact it should not be less than six times the proposed height of bank.

Great care should be taken never to work a wheel-scraper *over* a bank in the same way as the old Dutch blok. They were never intended to go over a bank, but must be used in exactly the same way as a Scotch cart *along* the bank, and then they will give every satisfaction and save endless worry and breakage. Great care should be taken to see that all the bearings and axles are greased every morning before starting work. It will be found that attention to detail, such as greasing the bearings, and tightening up the nuts and bolts, make a very great difference in the amount of work done in a day.

There are a great many other matters of detail which one learns by experience in working these machines, such as the length at which you tie your hind yoke, &c., &c., which are too numerous and too trivial to insert in a paper, but at the same time they all go to make the difference between an experienced and an inexperienced man; in fact the difference between theory and practice.

Now, Mr. Editor, we come to the most knotty question and the one upon which you will find a great many men differ,

and that is the cost per cubic yard of shifting the earth.

The capacity of No. 3 Scraper is 15 cubic feet, and the number of scraper loads that go to the cubic yard on the average in a large job is three, which I think is a low estimate and well within the mark.

The amount of earth that can be shifted in a day by one scraper of course depends entirely on the length of the run and the height of the bank. Taking an average run of 150 yards from tip to tip a fairly good span of oxen should deliver 80 loads a day, making 240 loads for three scrapers running, making 80 cubic yards per day.

Now to work three scrapers properly you require 5 men at 2s. 6d. per day and 3 boys to lead at say 1s. 6d. per day, making 17s. a day, or about 2½d. per cubic yard.

To plough costs on an average about ½d. per yard, and allowing another farthing for wear and tear it brings you out at 3d. per cubic yard on the average.

It must be clearly understood that the above estimate is for a run of about 150 yards and a bank not more than 12 feet high.

Of course some kinds of silty soils and sandy loam can be shifted for about 1d. to 1½d., and again other soils, such as some of our hard red Karroo with a longer run, go as high as 4d., but I think that you can take it that 3d. per cubic yard is a fair estimate and one that will meet the generality of cases. Well, Mr. Editor, I don't think that there are any points in the general working of scrapers that I omitted and I will wind up by apologising for taking up so much of your space, and by advising your correspondent to buy a scraper and start work in conserving water, and he will find it the most profitable investment that he has made for some time.

Mr. W. Halse, Carnarvon, Halseton, writes:

One of our immortal painters stated that he mixed his pigments with *brains*; the same ingredient is essential in dam construction. Let us briefly consider the ordinary dam, within the reach of the ordinary farmer, and whose capital need not consist of £ s. d., so much as of energy and industry—the aptitude for taking off his coat.

The expression “first catch you hare, then jug it” is familiar to most of us. So likewise, first locate your dam, then make it. Measure your arable land, and remember that each wetting means the application of about 3 inches of water, or, say, 70,000 gals. per acre. Hence seven irrigations per annum will mean half a million gals. per acre. Roughly estimate the catchment area in square miles, and, not to be disappointed, under ordinary circumstances, calculate that for every inch of rain over each square mile one and a half million gals. will be impounded. Matters being satisfactory proceed with your dam.

Start with the axiom, that dams do not “burst,” unless there is volcanic disturbance underneath. They come to grief either through percolation underneath, or from congested waters—insufficiently provided for in bye washes—going over the top. Both these sources of danger must be carefully provided against.

It is madness to lay down any inviolable rule for the construction of South African dams, so much depends on the rainfall, position, situation, material, and, lastly, the size of the farmer's pockets.

Under ordinary conditions, having located the site, remove all vegetable matter from the proposed base, more especially a belt say twenty feet wide in the centre. Clear away all gravel and loose stones, and, if possible, get to firm bed rock, but if good clay without any water carrying seams is encountered in trial pits, build upon the clay.

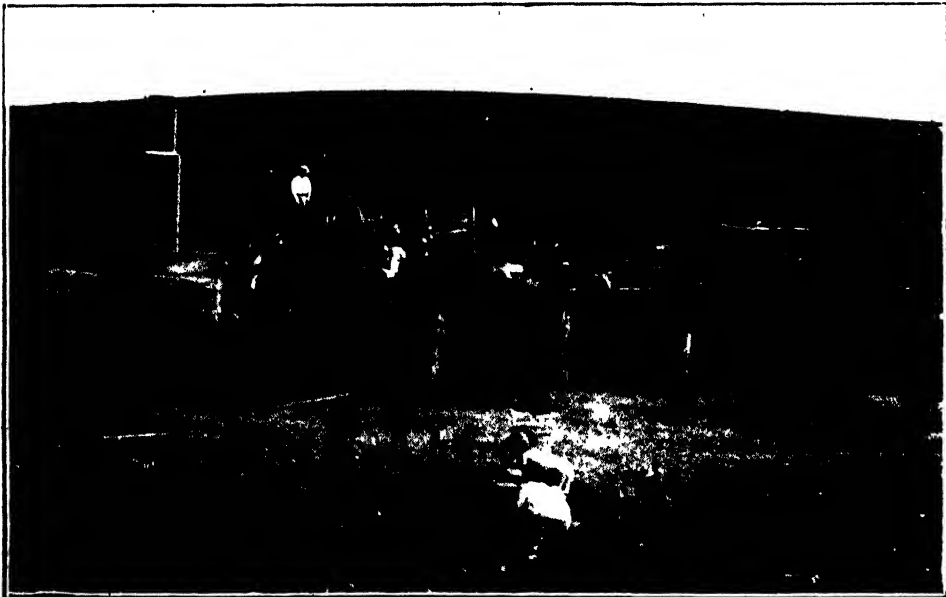
In marking off the base, a simple rule for an ordinary dam is to multiply the proposed height of embankment by 4, plus the top width. Hence if bank is to



TRIAL OF DISC PLOUGHS

At Farm of Mr. J. Moon.

(See No. 13, Vol. 17.)



DIPPING TANK

At Farm of Mr. A. H. Walker, Highflats.

(See Mr. Walker's letter in this issue.)

be twenty feet high, and the width on top to be ten feet—the width of base will be $20 \times 4 + 10 = 90$ this will allow of a $2\frac{1}{2}$ grade inside with $1\frac{1}{2}$ at back. If the structure is to be a larger one multiply proposed height by 5, this will allow a slant of 3 in 1 inside, and 2 in 1 outside. If the situation is wind-swept, and the “fetch” extensive, 3 horizontal to 1 vertical will not be too much to prevent damage by wave action.

Puddle Core.—If the material for embankment is of a good clayey nature, no puddle core in the made embankment is necessary. Put the best material in centre of dam. But if scoops and oxen are used, and the soil is brought on in a damp condition, and the layers not more than 6 inches thick, *the whole embankment will be practically puddle core.* The danger of leakage is not *in, but below,* the made embankment. Hence the necessity for cutting a good wide trench through any gravel or sandy strata. It is easy to waste more money in the foundations than the whole cost of the dam should be. Exercise every reasonable care, but remember that a trifling seepage or filtration is not a serious matter. The tendency will be for such leakage to diminish when the bottom of the dam, not the embankment, has settled down. This can be expedited by puddling same with cattle, when opportunity offers.

Pipes.—Ordinary pipes through base of bank with tap or valve on outside is the cheapest means of tapping the water; a grate or netting cage, say two feet square over mouth of pipe inside, will prevent trouble caused by bushes, water-tortoises, etc. The pipe joints (if sockets) should be leaded, and the pipe line laid in clay of *same consistency as embankment, but well rammed round pipes all along.* If too wet, a shrinkage might follow. To be on the safe side, one or more cement or concrete bars at right angles to piping could be put down, say a foot each way, and extending a yard or two on either side, but it is not essential. However the cost would be trifling. Syphons are more costly, and

at high elevation not satisfactory, and the farmers whom I am addressing are naturally prejudiced against something that they do not understand.

Sizes of pipes.—It is a common error to think that, say, two 3 inch pipes will discharge as much as one 6 inch pipe. A simple rule for ascertaining the area of pipes is to square the diameter and multiply by .7854. Example: take a 3 inch pipe $3 \times 3 = 9$, $9 \times .7854 = 7.0686$ inches. Taking the 6 inch pipe— $6 \times 6 = 36$, $36 \times .7854 = 28.2744$ inches. Hence a 6 inch pipe (apart from friction) will discharge four times as much as a pipe half its diameter.

Pitching.—The dam's neat appearance depends much on the way this is done. It will be necessary to have corresponding levels marked at the extremes of embankment, and the embankment trimmed to perfect alignment before starting the pitching or “Straating.” It is also of great importance that the stoning be laid on 6 inches of ballast,—stones broken up from the size of one's fist downwards, and this *to rest on solid puddled bank*, or the action of waves will soon shift the position of stones. After completion all the chinks or interstices should be well filled with gravel, and after the dam has once filled, when water has been drawn off, this should again be gone over, after which little or no attention should be necessary.

Back Slope.—This, in the rainy season, should be planted with roots of some binding indigenous grass, or better still with American aloes, a yard each way. If planted closely they will continue to live for fifty years. It is necessary to fence embankment, to prevent stock, for mischief's sake, pulling up the plants.

Spill-way, or Byewash, alias Outlet.—It is not safe to construct this nearer than six feet from level of top of embankment. One or two outlets should be made as opportunity offers, the farther away from embankment the better. If at end of bank, the near slope should be paved, pitched, and cemented till water is well away from embankment. It should have a good grade; its required

capacity should be carefully considered, and when decided upon, *it should be doubled*, when the expression would not be a *propos*—of “uneasy lies the head that” builds a dam!

Implements.—For short “leads” and embankments to say 10 feet in height a “Columbus” drag scoop holding about 6 cubic feet of earth, and drawn by 2 or 4 oxen is the most economical. A leader is unnecessary after the first couple of days, when the oxen will have “got to the ropes,” and a native youngster makes an excellent driver. These little scoops are streets in advance of the usual cast iron ones, the “Columbus” being of stamped sheet steel very light, flexible and eternal. They are stocked by Malcomess & Co., of East London and cost about 45 shillings.

In wheel scoops “Kilbourne J. Jacobs” cannot be beaten, they are or were stocked by the same firm, cost £13, hold 16 cubic ft., and will last for many years—if treated kindly, and oiled occasionally. Where five or six are used

it pays to have a “hitch” team, of 8 or 10 oxen just to fill scoop, when they can be instantly unhitched, and the pair go off with their load. I have had 30 such teams working on this principle, and nothing could have been simpler.

Heavy Rollers for compressing the embankment are quite unnecessary. There is *nothing* for consolidating earth-works like the hoof of an ox—especially when he is crawling uphill on his toes, with a heavy load behind him.

Means.—He who makes two blades of grass to grow in place of one, is said to be a benefactor to his race! What about the man who from the *veld*, incapable of supporting one sheep per acre, produces 10 tons of potatoes, 30 bushels of wheat, 3 tons of hay or 500 bushels of apples.

The State would invest wisely if he were paid on the £ for £ principle for all he expended, or advanced money at 3 per cent. The enhanced value would be ample security even if a second or third mortgage were held.

Judging at Shows.

LETTERS TO THE EDITOR.

DEAR SIR.—From your editorial article on judging at shows, I take it that in your opinion the judging at our shows is defective, is lacking in several respects, judgings are too abrupt, no reasons being given—are not instructive enough to educate the general public. These are defects by comparison with older institutions, to wit, English shows. As you have taken for comparison English shows,* then to treat the question fairly, you should not single out one feature or department for comparison. If to be compared at all, our shows should be compared *en bloc*. Defects by comparison with older institutions, existing under entirely different circumstances, may not be actual defects after all when all surrounding circumstances are taken into consideration. Shows are made up of

very numerous details, such details being arranged to meet existing circumstances. I think if the details or arrangements of our shows could possibly be raised to the same level of English shows (which at present, of course, is not practical), then I think the defects referred to in judging would also disappear. It is no use our trying to make Judges at our shows here adopt methods and systems which will not dovetail in with the other details.

You say Judges of shows should be like **Judges of law, professional.**† No doubt in theory this is very fine. Professional men or experts, you will admit, have a reputation at stake, and if you had professional Judges at our present shows, do you know what I think would happen? In many cases the professional Judge would absolutely refuse to give a decision

at all. Why? First of all he would require a re-classification of half the exhibits. Secondly, he would ask for days to do the work our Judges are called upon to do in a couple of hours. The professional man would take no risks of injuring his reputation. You will say, "Exactly so, this is what we want." I echo, "Yes, quite so. But is it practicable?" I fear not, at present. Our societies have not the means for minute classification of all exhibits; and secondly, if the exhibits were so minutely classified as would satisfy the professional man, then I fear the competition in the classes would be reduced to a minimum, and in many classes there would be no entries at all. The chief difficulties a Judge at our shows has to deal with are the merging of different classes of exhibits into one class, and the amount of work he is called upon to perform in a limited space of time. If carefully considered from all points, I do not think there is much fault to be found with the present system of judging, and I fear what you, and I may say, we all, would like to see is rather far off, and can only be attained by a general levelling-up of all details to the standard of English shows. Before concluding, I will refer to some slight improvements and advances that I think will be found practicable.

You make a great point of the educational element of a show, and, I think, rightly. At the same time, I am not sure that this suffers as much as you think from the Judges not giving details as to their judgments. I take it the education imparted by shows is chiefly considered from the standpoint that those chiefly interested in live stock get education in that line; those in machinery, in that section, and so on. The man interested in, say, horses will carefully examine all the exhibits, and by dint of careful examination of each animal, and comparisons made, and go into the whys and wherefores of the Judges' judgments, must, if he knows anything about horses, learn the merits and defects of the animals, and so on, each person following his special line. If, on the other hand, it is to be expected that shows are to educate the general public up to the standard

of each and every exhibit, I fear it will be a hopeless task. No amount of explanation from a Judge of horses could even educate a person who knows nothing about horses, unless the listener has a fair knowledge of the exhibit; explanations from a Judge would be a waste of time. The amount of knowledge acquired at shows depends more upon the endeavours of the individual to obtain the same by reasoning and comparing the exhibits for himself than by what the Judges may say. In any case, whether this be so or not, I feel convinced that under existing circumstances it is impracticable for Judges to dilate and go into full details as to the merits and defects of each exhibit. As I said at the outset, the defects are defects by comparison with shows held under quite different circumstances, but are not actual defects at all, and until we can divide and again sub-divide our classes and sections, so as to give each and every variety and species a class to itself, we will have to accept judging in a general form on a broad basis. The crux of the whole question is, I think, in the classification of exhibits, and again the sub-division of the classes so as to have each exhibit not only in its proper class, but in its proper sub-division of such class. When we are old enough and far enough advanced to do this, then we can have professional Judges or experts for each class, and adopt the methods of judging by points, giving reasons for judgments, etc., etc. As this much desired end is still far off, the question is:—Is there any practicable way of steering in the desired direction?

As Secretary for the Witwatersrand Agricultural Society, I gained some experience in the detail of the working of shows, and perhaps some methods adopted by me there may be worth considering by the local societies.

I endeavoured as far as possible to obtain the best qualified men as Judges from the adjoining States and Colonies by paying all their travelling expenses, and on the whole was successful. The advisability of getting strangers as Judges is, strictly speaking, more a matter of sentiment than anything else, as I cannot believe that any respectable person would be influenced in awarding his judgment by

personal acquaintance with the exhibitor, and more especially under the Single Judge system now in vogue. However, on the whole, I think it is as well to get your Judges as far a-field as possible.

In my Judges' books I reserved a blank space opposite each section, in which the Judges were requested to note in a general way any remarks they thought fit about the exhibits.

I think the appointment of Judges a most important question, and one that should be taken in hand long before the date of the shows, and not as very often is the case, too late to fill up satisfactorily in case of refusal to act.

I had always three names of Judges down, numbered 1, 2, 3. If No. 1 refused, I then asked No. 2, and so on. I cannot see that there would be any difficulty in getting first-rate men to act as Judges at the Pietermaritzburg Show if their expenses were paid, and their visit made pleasant for them.

Yours, &c.,

A. K. MURRAY.

Nottingham Road,
August, 11, 1903.

[It is perhaps desirable to correct two small misconceptions.

*Our reference to English shows was the following:—"The latter system (nailing cards, giving the points, to prize-winners' stalls) is adopted by several English shows, and has proved useful and attractive."

† The reference to professional Judges was:—"Judges at shows, we are inclined to think, should, where possible, be like Judges of law, professional. They should be able to criticise to a nicety, and they should be able to state plainly why they arrive at their decisions."—Ed. *Agricultural Journal*.]

SIR.—"Judging is the very foundation of Agricultural Shows," is the second sentence in an article published in the *Journal* of July 10th, under the heading of "Judging at Shows." True, but in order that the judging shall be educational as well, it is necessary that the ex-

hibits in each class shall have some degree of uniformity. Given a class of animals, fairly uniform in quality and all of one breed, and a man who is thoroughly acquainted with the special points and peculiarities of the breed, will have little difficulty in deciding which are the best in the class, and in giving his reasons for his selection.

But ask the same man to judge a class, such as is shown at every show in the Colony under the heading, "Horses for General Purposes." He will find presented to him, hackneys, half-bred cart and blood horses, Arabs, ponies. Anything and everything that cannot find a place elsewhere is crammed into this class, and the unfortunate judge may find he has to decide whether a hackney or a half-bred cart horse, both of equal merit of their kind, is the best horse!

The same occurs in the cattle, where a class is usually made "for any breed not otherwise provided for." Kerries, Ayrshires, Channel Island, and various grades of these breeds, and all sorts of cross bred cattle are jumbled together, and the judge has to decide which are the best. In such cases the selection cannot be educational; the animals cannot be fairly compared.

I admit that during the last few years a very great advance has been made at all the shows in Natal in classifying the various breeds, and that there is greater uniformity in the exhibits than formerly; there is, however, still room for improvement in this respect.

The difficulty is not so great in classifying and judging produce and manufactures, yet judges of these exhibits, however, often judge the same article in a different manner. For instance, a man will show a muid of very large sound potatoes and obtain a first prize against another exhibit equally good, but of medium size. The same potatoes may compete again at another show a few days later, and the very large ones will be rejected as being too big, and the medium sized ones obtain the prize as being the proper size for "table" potatoes. Which judgment is correct?

Judges are always selected, if possible, from districts outside of that in

which the show is to be held. My experience is that the judging at shows in Natal is usually very fair and satisfactory. Mistakes, of course, are made, but exhibitors must put up with these; they are one of the troubles of exhibiting, but are fortunately few and far between.

The education that many of us get from showing is, that until we come to put our stock or produce, as the case may be, alongside some we have to admit is better, we are apt to imagine we have the best in the Colony. The feeling of disappointment at discovering one's pet swan is no better than a goose is a very good incentive in making a man determine to improve his stock or produce, and endeavour to beat his opponent in future.

Yours faithfully,

C. B. LLOYD.

Highlands, August, 1903.

JUDGING SHEEP AT SHOWS.

DEAR SIR,—As I have had many years' experience judging at shows in Australia and Tasmania in the Merino sheep classes, perhaps you will excuse me for making a few remarks on the subject of "Judging at Shows," which generally is an unthankful task. It is also one of the most difficult undertakings which an Agricultural Society has to contend with, and the manner in which such appointments are made at times are very ridiculous.

If a man who thoroughly understands the art of sheep breeding were to follow the Judges at every show held in South Africa in one year, he would, at the end of the season, come to the conclusion that "Judges differ." Knowing his business, he would have recognised the good work from the bad, and also come to the conclusion that the system of judging wanted a thorough cobwebbing.

We should, in South Africa, have a uniform system of judging. To bring this about there should be a conference of all the Societies giving prizes for sheep, and not only should the question of Judges engage attention, but there must also be an assimilation of the sheep classes

in the schedules of the various societies, so that strong, medium, and fine wool sheep are not competing in the same class, as it is a moral impossibility to bring them together.

As regards judging, the greatest difficulty is getting a satisfactory basis to work upon. The Departments of Agriculture should appoint Committees, consisting of capable gentlemen, to make a scale of points. This would greatly facilitate the matter. I am giving one at the foot of this note which has always worked well in Australia, and one which I have had the honour of acting under at many of the principal exhibitions in that country.

Then would come the question of one or more Judges, and the majority should settle this question. Personally I am in favour of the Single Judge system, so long as the Judge is a thoroughly competent man. Professional Judges in my experience have been a decided success, as they are always prepared to give their reasons why they have awarded such and such an animal the first prize.

The point system for judging merino sheep is herewith appended, and I trust it may be interesting to breeders and Agricultural Societies, and, if adopted, I feel sure would give general satisfaction.

I am etc.,

Bloemfontein Post,

Bloemfontein, O.R.C.

"BREEDER."

	Formation and Constitution.	Breeding Style and Character.	Length of Staple and Density.	Evenness and Trueness of Covering.	Colour and Quality	Size.	Total
Points	30	20	15	15	10	10	100.

A party of forty six German agriculturists, landowners, and students are touring America for the purpose of studying American agriculture.

Dipping Tanks.

MR. G. S. ARMSTRONG, M.L.A.

A FEW days ago Mr. G. S. Armstrong, M.L.A., was good enough to give some of his views on dipping tanks to the Editor. In effect, Mr. Armstrong said :—

The value, or rather the necessity, of dressing cattle with some kind of tick-killing dip has been recognised on the coast for years. I also tried spraying, but the liquid could not be forced into the hair, and, in consequence, spraying proved useless. Hand treatment being extremely slow, laborious, and very ineffective, it was therefore with great satisfaction that I saw a few months ago the excellent system at Nel's Rust for complete submersion. I immediately realised that this was the proper plan for clearing stock from vermin, and I promptly made myself a similar dip.

In some respects I introduced a few alterations. My gates for the yards I have made sliding ones, like that of the Nel's Rust Dip, between the race and the dipping tank. Such gates are worked more easily in my opinion. Again, in the passage between the tank and the dipping yard I have a small sump or catch-pit. Into this the liquid drains from the dipping yards, and from it there are two 2-in. pipes. One pipe leads to the bath and is open while dipping is going on, and when dipping is not going on it is stopped, and the other pipe carries off to waste the rain that may fall in the dripping yards. The sump is about eighteen inches across and about three inches deep. I consider this a decided improvement.

For getting stubborn or timid animals into the bath I use a windlass. It is fixed on the roof uprights over the middle of the bath. A double rope, of length sufficient to go up the race, is fixed to it. At about 18 inches from the loop-end a length of about 2 feet is tied cross-wise to serve as a loin strap. Here you have the essentials of the breeching for a trap horse. When a beast proves refractory

this elongated breeching is thrown over him, and a few turns of the windlass brings him into the bath. The short length of rope at the end is for the purpose of hauling back what I may call the breeching when it has done its work. This sketch may assist the description.



- a Windlass.
- b Double Rope.
- c Loin Strap.
- d Loose Short Rope.

Some haul by the horns. Irrespective of other considerations this plan gives more trouble—indeed, the trouble of getting the reim or rope off the horns while the animal is swimming is often not small.

For boiling the dip I have only one 400 gallon tank ; on the top of that tank I have another of 200 gallons for feeding the lower one with water. I also use fire bars in the furnace for improving the draught. The fire bars are old axles and the like.

In my collecting yard I have the division about the middle ; which I prefer.

If I were building another dipping tank I should dispense with the roof. The roof baulks animals, and is an unnecessary expense. To keep the rain out of the bath and to prevent evaporation I would just cover it, so to say, with a lid made of short lengths of roof iron placed across. This plan, even as regards the rain and heat, would be more effective.

In making my bath I dug out all the soil, and with planks on the inside built up walls of concrete. An easier and cheaper way in firm soil would be as follows :—Dig out one wall, making it only broad enough for a man to work in—say 18 or 20 inches. When dug out, fill up with concrete. Then make the other wall. When both are finished, dig out the

soil between, and then you have the bath in the rough. You then, of course, put in the ends and the floor, and cement plaster the whole of the inside. My concrete was one of cement, five of stone, and three of sand. Built in this way no skilled labour is wanted.

There is another improvement I have thought of, and one which I mean to adopt. I intend putting a balancing flat door at the entrance of the bath. When an animal goes on it, as soon as he gets beyond the balancing point it will drop some twenty inches, and the animal will be plunged into the liquid. It will be on the principle of the doors used in some kinds of rat-traps.

I used twenty barrels of cement. Where a man has rough timber for the yards and can get stone and sand for his concrete at no great expense, he should be able to complete the work, with the few modifications I have suggested, for a sum between £70 and £100.

The drop into the tank I approve of, but if I were making another tank, I would not have the comparatively sharp angle where it begins. It should be quite rounded off, so as to do away with any danger of animals hurting themselves behind their hocks.

I do not wish these observations to be taken in the light of criticism of the Nef's Rust dip. In copying anything, improvements are sure to suggest themselves to those who copy. By introducing the stock-dipping tank, Mr. Joseph Baynes has conferred an immense benefit on the Colony, and one for which all Colonists, especially those of the Coast and Midlands, should be grateful.

LETTERS TO THE EDITOR.

DEAR SIR.—In compliance with your request, I give you my experience on cattle dipping. In the first place, I must not take the credit for this tank as it was built on the syndicate system. There are four in it:—The Hon. T. Hyslop, M.L.A., Mr. C. B. Addison, Mr. Thos. Morton, and myself.

The dipping tank I find beneficial in every respect. It keeps the stock healthy

and clean, both horses and cattle. Since I started to dip last January, I have not lost a beast, and I have dipped five times, i.e., once a month up to the end of May, and I can safely say all the cattle in the district that have been dipped looked better at this time of the year. All are in good order, clean skins, and no brand-ziekte. The tank also affords a great saving in expense, as compared to hand dressing. With the number of Natives it formerly took to do about thirty head a day, we can now do over a hundred an hour comfortably. I consider the tank has paid itself this season.

I bought a lot of loot horses two years ago to my loss. They turned out to be bad with mange, and I tried everything to no effect, but I am quite sure that if I had had the tank to dip them, I would have saved the lot. The few that I have left are perfectly clean from mange, with good coats, and in good condition.

I noticed in one of the last *Agricultural Journals* that Mr. P. Otto says if he were to build another tank, he would not have the 5 feet 6 inch drop. I beg to differ, for both horses and cattle, but especially the former, when they have been three or four times dipped, they get to know what is coming, and they simply slide in without immersing their heads and necks, and sometimes part of their backs. With horses I have always had a boy posted half way along the tank with a bucket of dip to pour on their heads, but all underneath the neck and jaws never get touched, and more than that, I have another boy with a forked stick to try and push the heads under, but it is more than one can do. I consider the tank is not efficient without the drop.

There is no use in my going further into details and monopolizing valuable space in your *Journal*.

Yours faithfully,

A. CLARK.

Mount Ashleigh.

Howick Rail.

DEAR SIR.—Your letter requesting an expression of opinion on cattle dipping arrived during my absence; hence the de-

lay in replying. My dip, which was completed in April, has so far given satisfaction. Two of my neighbours, who dipped large herds of cattle, state that their cattle have not only been free of ticks since, but also have not developed mange to anything like the same extent this winter as formerly. I used the Nel's Rust formula for the dip. The tank and kraals are somewhat differently arranged, as they had to be built on sloping ground—the tank and race form the lower side of a rectangle, the kraal and draining yard being the upper portion. The crush pen is a corner of the kraal railed off. The enclosed photograph will give you an idea of the general arrangement. I think it would be a great improvement to make the race with a double row of posts, the inner ones 2 feet high, giving a width of 18 inches, the outer ones giving a width of 3 feet. The outer and inner rails

should be connected by a slab sloping back to the outer posts. I would also make the slipway into the tank almost semi-circular in section, and only 18 inches wide.

I have given the above particulars, as many farmers have not a level field of ground in a suitable position, and there is also some saving in labour and material, where kraal, draining floor, crush pen, and race are all joined in one block.

Yours faithfully,

ALEX. H. WALKER.

Highflats.

[The photograph, unfortunately, is not suitable for reproduction. It will be shown with pleasure to anyone who may call at this office. A photograph better suited for reproduction, sent to us a few weeks ago by Mr. Walker, will be found in this issue.—Ed. *Agricultural Journal*.]

Correspondence.

To the Editor *Agricultural Journal*.

RHODESIAN DISEASE.

DEAR SIR,—I read with interest Dr. Theiler's report on Rhodesian Redwater, also the letters of Mr. Alexander and others on the Cattle Dipping Tanks; and I believe the tanks will prove of great help in keeping away this Rhodesian Redwater, which is now threatening us.

In addition to the dipping, I believe if Bisulphate of Soda and Carbolic Acid were given the cattle in medium doses, periodically, it would also help in keeping the disease from them.

This is only a suggestion of mine, as seeing that the former when used internally has strong disinfecting powers, and the latter also very useful in nearly everything, I believe much benefit would be derived from using them.

Were I using the medicine I should give the following dose: Bisulphate of Soda, 1 oz.; Carbolic Acid, $\frac{1}{2}$ drachm, in about one bottle of water. They should

be mixed in quantity according to the number of cattle being dosed, so as to get a uniform strength. I do not think it a cure, but I do think it would place the animals in a better condition to resist the disease if it comes.

I remain, yours faithfully,

ARTHUR M. ADEY.

Sneezewood,

August 16th, 1903.

In Great Britain canned apples are regarded with great favour, and their consumption in large hotels, restaurants, and by families is of an extensive character. In this form they can be kept throughout the year, and for cooking purposes, being ready pared and cored, find almost as much favour as the fresh fruit. Large hotels and restaurants in London and provincial cities often purchase stocks from 500 to 1,000 cases for use at periods during the year when the fruits are dear or are in short supply in the market.

The Cattle Rancher's Enemies.

IN an interesting article upon cattle-ranching in the south-west, which appears in the current number of the "American Review of Reviews," some curious information is given as to some of the difficulties with which ranchmen have to contend:—

The frequent presence on the prairie of a little green weed called "loco" is a constant source of danger to cattle and of worry to ranchmen, while efforts to exterminate it have signally failed. "Loco" has the same seductive and fatal influence over cattle that opium has on mankind. While eating it the victim is apart from the rest of the herd, and for days is oblivious to grass, water, and companions. In its early stages the habit produces little more than a drowsy sensation, and can be checked and stopped by transferring the animal to a pasture where the weed does not exist. After a few months' continued eating the victim becomes insane, and refuses to leave the place, while often attempting to gore the first man who tries to drive it. Finally, the eyes dilate, there is frothing at the mouth, and the animal dies in convulsions.

A constant menace to all ranches are the various animals that live on the plains. Strange as it may appear, the industrious and seemingly harmless little prairie dog causes the most damage. In countless thousands he is gathered in sociable little colonies, and all day long scampers in play or digs deep in the ground. Each family occupies a hole one foot in diameter, and from 10ft to 20ft deep. In cold weather rattlesnakes make these holes their home, and, as they eat little and sleep much, are not undesirable boarders. Aside from the danger to horsemen and cattle occasioned by these holes, the serious phase of the nuisance is the almost total destruction of grass about the dog towns. Powder and shot prove ineffectual, and poison alone will exterminate them. During the winter, when

other duties are not pressing, cowboys visit several thousand holes, distributing at each a handful of poisoned grain—a mixture of maize, strychnine, cyanide of potassium, oil of anise, and molasses. Instances of success are numerous. One ranchman in Andrews County, Texas, now pastures 4,000 head where formerly only 750 could be accommodated. Appeals have been repeatedly made to State Legislatures to offer a bounty or else to provide free poison, and only recently Kansas has adopted the latter course, and appropriated 10,000 dollars.

As trespassers only, and not prey, cattle are frequently bitten by rattlesnakes, and killed. While shunned by ranchmen, these pests are not an unmixed evil, since they destroy prairie dogs, rabbits, and other burrowing pests. The ranchman has an ally in the powerful bull snake, which is larger than the rattler, and, though harmless to man, annually destroys great quantities of rattlesnakes.

Holland farmers play a trick on the crows which keep the birds away from their grain fields (says an exchange). They make small cornucopias of stout paper, smearing the inner side with bird lime or some sticky substance. These are filled with a few grains of corn and stood about the field by sticking the points into the earth. Down comes Mr. Crow, thinking himself in great luck to find so much corn ready for him. He tries to peck at it. Lo! a fool's cap sticks to his head. He cannot get it off. His friends are scared, too, as they see him scrambling and staggering about, for he cannot see which way to go. After he tears the sticky cap loose he vows that he will never go near that field again. This method of keeping crows away is better than shooting them, as they are at all times very interesting birds, and the damage they do to the growing corn is insignificant compared to the great good they do all through the year by destroying millions of injurious insects.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	J. Ralfe ...	Frere
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	F. R. Moor ...	Greystones
		"	J. G. Hatting ...	Rama
		"	A. C. Harding ...	Meadow Bank
		"	H. J. Hatting ...	Kopliegte
		"	C. J. Labuscagne ...	Haasfontein
J. Button ..	Estcourt, South of Bushman's River	"	Unknown ...	Mooi River Pound
		"	J. Piccione ...	Greenfields
		"	J. Lawrence ...	Grantley
J. J. Hodson ...	Lion's River ...	"	W. Fletcher ...	Erina
		"	W. Henderson ...	Hilton
		"	M. A. Sutton ...	Shaw's Flat
		"	Jos. Raw ...	Buffel's Bosch
E. J. B. Hosking ...	Upper Umkomazi	"	J. W. T. Marwick ...	Mona Glen
K. Soutar ...	Portion of Lions River	"	K. Soutar ...	Stey Braes
		"	A. Clouston ...	Nottingham Town Lands
J. Swales ...	Manda and Indwedwe	"	Pumputa & Charlie	Indwedwe
W. Wilson ...	Polela ...	"	J. D. Watson ...	Rainbow
		"	H. Nicholson ...	X.L. Farm
		"	H. Brown ...	Prosperity
		"	J. Stone ...	Gowrie
		"	J. Comrie ...	Hepburn
L. Trenor ...	Alfred ...	"	W. Niemack ...	Macton
W. Gray ...	Upper Tugela, South of Tugela River, at Estcourt, North of Bushman's River	"	N. J. Vandermerwe	Gourton
		"	W. P. Gray ...	The Heff
A. H. Ball ...	Weenen ...	Lungsickness	Seddon & Harris	Weenen Commonage
		Scab	C. R. Leroux ...	Waterfall
		"	L. J. Lotter ...	Waterfall
		"	J. P. Lotter ...	Berg Vleit
		"	J. J. Vermaak ...	Winterhoek
		"	G. J. Vanderwesthuyse	"
		"	C. J. van Rooyen	Annadale
		"	C. P. F. van Rooyen	Mona
E. Varty ...	Umvoti, Western Portion	"	J. G. Nel ...	Elladale
		"	G. T. Van Rooyen	Pampoenek
C. J. van Rooyen...	Krantzkop ...	"	D. J. Martens ...	Jammerdal
		"	Nuss Bros.	Salem
R. J. Raw ...	Impendhle ...	"	Albert Meliffe ...	The Forks
		"	S. Faber ...	Virginia
		"	E. Allborough ...	New Forncett
		"	Geshla ...	Impendhle Location
C. Swales ..	Umlazi ...	Lungsickness	Cold Storage and Supply Co.	Richmond Farm, near Pinetown
		"	Native, Sam Pawkes	Assegai Kraal, near Betha's Hill
		"	John, & Mr. Kirk	Umlazi Location
		"	Miss Scott ...	Glenugi, New Germany
A. Hair ...	P.M. Burg City and Umgeni	Scab	E. Taylor and Umbabana	Zwartkop Location

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
E. G. Clerk ..	Newcastle ...	Lungsickness	Dundu ...	Styl Krantz
A. J. Marshall ...	Dundee ...	Scab	Sai M'Lief ...	Banff
		"	N. Glutz ...	Swiss Valley
		"	H. Thorn ...	New Port
		"	Willie Africa ...	Waschbank
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gunena ...	
		Lungsickness	Mooty Metwa ...	Zietman's Drift
C. E. Walker ...	Umsinga ...	Scab	Hlabelela ...	Location
		Lungsickness	Umtagati ...	Mhlezunga
		"	Mbitgi ...	Craigneathen
		"	J. S. Vanderwesthuysen ...	Pomeroy T. Lands
		"	Mahakana ...	Jobsdale
J. Chaplin ...	Klip River ...	"	James ...	Kleinfontein
		"	Malandala ...	Matowan's Kop
		"	Umbali ...	Kleinfontein
		"	Matobula ...	"
		"	Gepo ...	Arcadia
		Scab	W. Wright ...	Colworth
		"	S. Schoeman ...	Maritz Drift
		"	C. M. Wessels ...	Welkom
		"	P. Nicholson ...	Hobsland
		"	W. Leathern ...	Clydesdale
		"	Mahatehi ...	Georgina
		"	H. W. Boers ...	Alexandra
		"	Mrs. M. K. du Plessis	Maggiesdale
		"	J. C. Buys ...	Reit Kuil
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	W. Newton ...	Excelsior
		"	Unknown ...	Acton Homes Pound
		"	W. O. Coventry ...	Goodoo
R. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	H. Benkes ...	Roodekop
		Lungsickness		
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata ...	"
		"	Umshigashi ...	Welgevonden
		"	Umfumwa & Dehla ...	Waterval
		"	F. Combrink ...	Bankroet
		"	Kumandi ...	Hlobane
		"	T. Pretorius ...	Sterkspruit
		"	L. Botha ...	Waterval
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Kwapela & Silemela ...	Welverdiend
		"	Umsauw ...	Langverwacht
		"	J. J. Gove ...	Uitzicht
		"	H. Davel ...	"
		"	Solyelana ...	Leuwnek
		"	Umkonyana ...	Welverdiend
		"	G. van der Westhuizen ...	Vaalkopjes
C. T. Vaughan ...	Paulpietersburg ...	"	Stumpf ...	P.P. Burg T. Lands
		"	Natives ...	Jachtbaan
		Scab	— Heine ...	Bedrog

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and 2 flocks of sheep under license for Scab as under :—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts				1 for Lungsickness	2 for Scab.
"	Nkandhla and Nqutu Districts...	...	...	—	" — "
"	North of White Umfolosi and Umfolosi Rivers	...	...	1	" — "
Total				2	2

Rinderpest exists at undermentioned places :—

Estcourt Division.—Sans Souci.

Zululand.—Eshowe, Umlalazi, Mahlabatini, Lower Umfolosi, Nkandhla, Entonjaneni, and Ndwandwe Districts.

Vryheid District, Paulpietersburg District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 18th August, 1903.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of July, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same period from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	72.4	54.1	80.3	47.4	1.16	8	.49	7th	1.16	.27
Stanger... ..	76.2	51.5	85	45	.66	8	.30	11th	.66	.54
Verulam	72.5	50.9	82	38	.53	7	.18	11th	.53	.18
Ndwedwe	70.1	49.0	86	43	.94	6	.31	18th	.94	...
Newcastle	61.8	40.5	70	30	.19	2	.19	18th	.19	.00
Estcourt	69.6	34.3	80	29	.60	1	.60	18th	.60	.15
Port Shepstone ...	78.5	48.7	82	44	1.39	3	.90	6th	1.39	...
Umzinto	78.3	44.7	85	42	.92	6	.28	6th	.92	.34
Richmond	68.0	42.0	84	35	.81	6	.37	16th	.81	.24
Maritzburg	71.6	41.9	87	34	.34	4	.13	17th	.34	.23
Howick... ..	67.7	35.7	80	27	.33	5	.21	18th	.33	.38
Ladysmith	69.4	33.3	79	25	...	...	...	...	...	...
Weenen	71.9	33.3	83	24	.64	2	.40	18th	.64	.14
Hilton Road	66.7	39.4	82	32	.26	6	.11	17th	.26	...
New Hanover	69.1	40.3	83	33	.64	5	.47	17th	.64	.14
Mapumulo	75.1	46.4	80	40	1.10	2	.69	18th	1.10	.75
Nongomo	72.6	48.7	82	41	.52	1	.52	18th	.52	...
N'Kandhla	58.3	36.5	70	32	.80	1	.60	16th	.60	.70
Qudeni	59.2	38.4	69	30	.97	14	.63	18th	.97	.68
Melmoth	68.9	47.8	85	40	.69	6	.30	18th	.69	.11
Eshowe... ..	70.4	51.7	86	45	.92	2	.52	12th	.92	...
Point ... ..	...	...	...	...	1.02	7	.48	10th	1.02	.17
Paulpietersburg ...	74.3	...	81	...	.31	1	.31	14th	.31	...
Nqutu	61.6	24.7	72	11	.92	3	.60	8th	.92	.25
Mahlabatini	74.4	46.0	88	41	...	...	...	...	...	.46

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.
- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 57a.—Single young man of Scotch parentage, aged 25, who has had eight years' practical experience at Home, where general farming operations—agriculture and stock—were undertaken. Chief agricultural crops were wheat, barley, oats, turnips and potatoes. Cattle, more particularly Shorthorns, sheep and horses, principal stock. Is well up in rearing and breaking in of horses. Is an abstainer.
- No. 59a.—Scotsman, 21, with two years' local experience, seeks employment on farm. One year was spent on farm where general stock and agricultural farming operations were undertaken. Second year, chiefly devoted to poultry farming. Has thorough knowledge of the management of horses.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 61a.—Englishman, 26 years of age, son of a well-to-do farmer in Gloucester, England. Has spent all his life on a farm. Is well posted in agricultural and stock farming. Has been twelve months in Colony, last six of which have been spent on one of largest stock farms in Natal. Present employer, who is leaving Colony, speaks well of applicant.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.

A few years ago Mr. W. H. Barnes, of Sioux City, Iowa, U.S.A., succeeded in training two moose to harness; not only did he manage to make them docile, but, having observed that these big and stupid-looking deer were quite indifferent to what height they jumped down, he conceived the idea of making them more valuable for show purposes by teaching them to jump from a height into water. After, it is said, two years' patient education, he induced them to leap from a height of 50ft.

Here is the latest way of finding a queen bee, as described in "Scientific Queen-rearing," by Doolittle:—"Blow some smoke into the entrance to alarm the colony. Two or three puffs will be sufficient. Take off the cover and watch the behaviour of the bees. Those at a distance from the queen will come up between the frames and walk across the top bars. Keep close watch. Finally, at a given point, a dozen or two will stop and sort of smell down between two certain frames. If these two frames are taken out altogether, the queen will be about the first thing seen when they are separated. This method never fails with me; but some little experience is necessary in order to catch on to the trick."

Pound Notices.

THE following stock, unless previously released, will be sold on the 16th September next:—

Inhlazatie.—Red and white cow, with black and white bull calf; black cow, white belly, with black and white heifer calf; black yearling bull calf.

Vryheid.—Black and white ox, 7 years old, white face, belly, and legs, and white on shoulders, branded J U; black bastard Zulu ox, 8 years old, white spot on flank, branded H W. These oxen are in the quarantine area, and may not be brought to Vryheid Pound.

Ginginhlovu.—Black and white ox, no brands, good condition.

Mahlabatini.—Dark brown cow, about 6 years of age, no brands or marks.

Nqutu.—Black and white ox; black and white ox, branded right hindquarter like C M; black and white ox, branded right hindquarter like P M, ear marked; red and white Poley ox, ear marked; bay gelding, black points, scar on near fore coronet, about 14½ hands; brown mare mule, about 14 hands, brand indescribable, looks like A and Z (reversed) combined.

Utrecht.—Grey mare, about 14 hands, age about 7 years, good condition, branded near quarter B S, and V on off quarter. Impounded

by Police, 28th July, supposed stolen property: Chestnut pony, no brands, short tail, goose rumped, good condition, about 12½ hands.

Albert Falls.—Grey gelding, branded M.H. and indescribable mark, on hip; three cows, 1 dun and 2 black, branded M on hindquarters.

The following will be sold on 7th October next:—

Howick.—Black ox, white under neck, white spot on right side of nose, branded



on right hip.

Maritzburg.—Bay pony, entire, height about 13½, near hook very large, half near hind heel and foot white, little white off hind heel, long tail, no brands visible, aged 2 years, lame; probable value, £1 10s. The above animal will be sold at the expiry of one month from this date (August 15th) if not previously released.

Running on the farm of Chas. Scrapp, Lot 18, New Howick Settlement.—Black yearling bull, small white streak on each flank and across the rump, a little white under belly, no brands visible. The above animal will be sold at the expiry of one month from this date (15th August) if not previously released.

District Reports.

EMPANDHLENI, 31st July.—The weather has been very mild for this time of the year, with the exception of a few days' cold wind in the early part of the month, terminating in a good downfall of rain, and a wind storm which swept over the Magistracy on the 24th inst. The pasture round the neighbourhood is still very bad, but there is every sign of an early spring. The total rainfall for the month was 60 inch, the maximum temperature 70 degrees, and the minimum temperature 32 degrees. The scarcity of grain still continues amongst the natives, but quantities of imported mealies are being brought into the Division, by traders and storekeepers, at prices ranging from 27s. to 40s. per muid. In some parts of the Division the natives have already commenced ploughing in view of an early spring. There is a great scarcity of seed mealies in the Division, and unless the Government forwards a supply at an early date, I am afraid the next season's crop will be far below the average, the American mealies not being suitable for seed. Rinderpest, I regret to say, has been much on the increase, and has spread to kraals in the near vicinity of the Magistracy. Three fresh outbreaks were reported from the Ward of the Chief Ndabe. These outbreaks were caused by a native driving infected cattle from the quarantine area of the Chief Hashi. The natives

cannot be brought to understand the danger of infection, and unless they are carefully watched, they will continually carry portions of the carcasses of cattle which have died of the disease to their kraals, and thereby cause fresh outbreaks. It will be a difficult matter to stamp out the disease in this Division, unless compulsory inoculation is insisted upon, and a heavy penalty inflicted on those who refuse to comply.

CHAS. MCKENZIE, Acting Magistrate.

LOWER UMFOLOSI DISTRICT, 8th August, 1903.—The weather was dry and rather colder than usual during the past month. Rain fell on four occasions. A pretty severe thunderstorm passed to the south-east of the Magistracy early in the evening of the 5th. Stock are doing fairly well; only two deaths were reported from rinderpest. Small quantities of mealies, pumpkins, amadumbe, and amabele (test crops) were planted in the various locations throughout the district, the main digging season not having arrived yet owing to want of rain. Certain green mealies were actually being eaten in spite of the unusual cold and drought. Locusts in large swarms were in evidence on the 5th and 6th, passing from the S.W. to N.E. over the Magistracy.

A. R. H. TURNBULL, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W.H. Walker & Co. write:—Notwithstanding the fact that the new tariff has come into operation, the stocks under the new tariff not having come to hand prices

are almost the same as in our last; but there can be no denying the fact that if there is not a slump in many lines, there is sure to be a considerable reduction in prices.

Mealies.—Our latter remark applies more particularly to imported grain. Scarcely any Natal mealies find their way on to our market, and when one is informed that there is a glut at Delagoa Bay, that at Port Elizabeth mealies are being offered below cost, and that our Port is well stocked, with further shipments to arrive, it must be admitted that there is sure to be a drop.

Forage.—From 5s. to 6s. 3d. per 100 lbs.

Hay.—The supply of hay during the last month has exceeded all expectations, and prices have been as low 9d., 1s. 6d., 1s. 9d. and 2s. per 100 lbs. Bedding according to size of load.

Potatoes.—Some very good samples are coming forward, and prices have been everything between 4s. and 15s. 6d. per 100 lbs.

Beans.—From 21s. 3d. to 25s. 9d. per 100 lbs.

Tobacco.—From 2½d. to 6d. per lb.

Onions.—One hears that this article so necessary in every household, will be abundantly supplied later on; prices at present fluctuate between 10s. 6d. and 23s. 6d. per 100 lbs.

Pumpkins.—From 4s. 9d. to 15s. 6d. per doz.

Butter.—From 1s. 4d. to 2s. 6d. per lb.

Poultry.—Common fowls vary from 2s. 4d. to 3s. 5d. each; ducks, 7s. to 9s. per pair; guinea fowls 7s. 6d. to 8s. 6d. per brace; turkeys (cocks) 11s. to 12s. 6d. each; (hens) 7s. 9d. to 8s. each.

Eggs.—From 1s. 1d. to 2s. per doz.

Sundries.—Mutton 8d. to 10d. per lb.; pork 5d. to 7½d. per lb.; buck 9s. 3d. to 17s. each; trussed fowls 2s. 6d. each; partridges 4s. 3d. per brace; hares 1s. 9d. to 3s. 3d. each; rabbits 2s. each; venison 3d. to 9d. per lb.

Fruit.—Bananas, lemons, loquats, naartjes, oranges, papaws, pineapples

Vegetables.—Beans, cabbages, carrots, cauliflowers, celery, eschalots, lettuce, onions, peas, parsley, radishes, tomatoes and turnips.

Firewood.—Poles from 7½d. to 9½d. per 100 lbs.; cut, 9½d. to 10d.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business is greatly depressed, and what with banks pressing, scarcity of money, and stocks of every description being liquidated at a sacrifice, things are not too lively!

Mealies.—Enormous stocks are pouring in and going into bond. The demand is small, and quotations are very easy and all in the buyer's favour. South American yellows can be bought down to 8s. 6d. per muid in bond, and ditto whites 10s.; both quotations being below cost.

Potatoes.—Supplies are moderate and the demand fairly good. Best Colonials bring 17s. per muid, and Australian samples 15s. to 16s.

Forage.—Enquiry is very trifling, and mainly for racing purposes. About 10s. 6d. per 100lbs. is being paid for good qualities.

Hay.—No enquiry. Buyers of fodder mainly affect lucerne, and this article practically dominates the Durban market.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1,960 writes:—

Since my last report there has not been much change in the market. The grain market

remains stagnant, and very little doing in this line. The prices are as follows:—

Barley for seed purposes, per 163lbs.—Of this very little has been offered, and prices realize badly; from 14s. to 15s. per bag.

Barley, green for forage, per 100 bundles.—A better class has been offering lately, and realizes pretty well considering the amount coming forward for sale; from 32s. 6d. to 55s.

Bran, per 100lbs. bags.—Of this no South African has been offered lately; bran is mostly of Australian wheat, ground in this Colony; from 9s. to 9s. 3d. per bag. South American bran from 8s. 9d. to 9s. per bag.

Bales of Chaff.—There was not so much offered of this lately; the few parcels which were sold were of inferior quality, realizing from 7s. 6d. to 9s. per 100lbs.

Hay, "Manna."—Of this very little has been offered and prices remain about the same, from 8s. to 8s. 6d. per 100lb.

Hay, Natal. A fair amount of this was sold lately, realizing from 2s. 9d. to 3s. 6d. for bales of 50-70lbs.

Forage.—This still continues to come in largely, and prices remain firm from 9s. 9d. to 12s. per 100lbs.

Mabele.—Of this no South African stocks are offered for sale, only Bombay and Mozambique; Bombay from 17s. 6d. to 18. 3d., Mozambique from 15s. to 15s. 6d. per 203lbs.

Mealies.—Very little South African come to the market, in fact, practically nothing at all. What has been sold lately, chiefly South American yellows, realized from 18s. 3d. to 18s. 9d., North American whites 19s. to 19s. 3d., Delagoa Bay whites from 13s. to 14s. 6d. and 16s. to 16s. 6d., Bombay whites 18s. to 18s. 3d. per 203lbs.

Onions.—The depression in the market remains for this line, and there are hardly any sales to speak about, although the market is stocked daily with large quantities, prices ranging from 14s. to 16s. and 18s. to 20s. per 123lbs.

Potatoes.—The market is still well supplied, and prices remain firm for good potatoes. Best potatoes from 28s. to 30s. This is for locally grown, fresh from the earth; the best Colonial potatoes from 26s. to 27s., mediums from 20s. to 25s., inferior 12s. to 18s. per 163lbs.

Eggs.—There are any number of local fresh eggs coming on the market now, and prices in consequence are very much lower; best prices 2s. 9d. to 3s. for Colonials, and Natal 2s. 3d. to 2s. 6d.; imported from 1s. 6d. to 2s. per doz.

Poultry.—Ducks from 7s. to 8s. each; fowls 2s. to 4s. each; geese 8s. to 11s. each; turkeys, hens 8s. to 10s., cocks 12s. 6d. to 17s. each

Game.—Spring-bucks 30s. to 35s. each; partridges 3s. to 3s. 6d. brace; koran 4s. to 5s. per brace; guinea fowls 8s. to 10s. per brace.

Cattle.—Slaughter oxen £20 to £22 10s.; trek oxen £15 to £18; milk cows £25 to £35; ordinary £13 to £15; heifers £12 to £15; tollies £10 to £12; goats 20s. to 27s.; sheep 20s. to 30s.

The Queensland Government Poultry Expert states that New Zealand could have found a good market in South Africa for half-a-million fowls and ducks. The supply, however, was limited, only 100,000 head being sent to Capetown and Durban.

Stock Diseases Proclamations in force.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos. 38, of 1894; 1, of 1896; 34, of 1896; and 3, of 1897; or of any Act to be construed therewith, or of any Proclamation which may be issued thereunder.

PROCLAMATION No. 43, 1900.

Principal Veterinary Surgeon under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION No. 54, 1894.

Importation of dogs into Natal prohibited except under certain conditions.

PROCLAMATION No. 8, 1901.

Regulations under Lung sickness Act. Cattle allowed to leave an infected area upon written permission from Principal Veterinary Surgeon.

PROCLAMATION No. 59, 1901.

Cattle from Basutoland prohibited from entering Natal.

PROCLAMATION No. 29, 1901, and 52, 1902. Zululand declared an infected area. No cattle allowed to leave or enter that Province.

PROCLAMATION No. 46, 1903.

Cattle allowed to enter Zululand upon permit from Principal Veterinary Surgeon.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district allowed to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 98, 1901.

Cattle from Transvaal prohibited from entering Natal.

GOVERNMENT NOTICE No. 506, 1901.

Any part or parts or any material prepared with or from animals affected with or having died from Rinderpest may not be introduced into Natal nor be removed from one place in Colony to another, except under written authority from Principal Veterinary Surgeon.

PROCLAMATION No. 96, 1902.

Importation of cattle prohibited from following countries:—The Colony of Rhodesia; the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana, in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36, 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston, inclusive.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district permitted to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 15, 1903.

Cattle from East Coast of Africa prohibited from being imported into Natal.

PROCLAMATION No. 25, 1903.

Certain areas—Zululand and districts of Vryheid and Paulpietersburg declared infected areas on account of Rinderpest.

PROCLAMATION No. 63, 1903.

Importation into Natal of cattle, sheep, goats and pigs from Argentine prohibited.

PROCLAMATION No. 77, 1903.

Importation into Natal of horses, mules and cattle from Mauritius and India prohibited. Under certain conditions animals from India may be imported into Natal.

PROCLAMATION No. 79, 1903.

Portion of Ingwavuma district, Zululand, declared an infected area.

PROCLAMATION No. 82, 1903.

Sans Souci, Estcourt Division, and surrounding farms declared infected area.

Weekly Rinderpest Report up to 18th August, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths to date from the 26th May, 1903.
<i>Estcourt Division.</i>			
Sans Souci ...	...	...	1
<i>Zululand.</i>			
Eshowe District	8	16	184
Umlalazi District	13	23	73
Lower Umfolosi District ...	...	...	20
Nkandhla District	16	6	228
Mahlabatini District ...	4	10	50
Ndwandwe District ...	9	11	79
Hlabisa District	4	3	20
Entonjaneni District ...	1	...	1
Paulpietersburg District ...	...	...	7
Vryheid District	6	9	53

18th August, 1903.

S. B. WOLLATT,
P. V. SURGEON.

The Agricultural Journal

AND MINING RECORD.

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Judging at Shows.

OUR remarks on judging at Shows have evoked much interesting correspondence. Whether the interest will pass away, or whether it will have an influence in future Show management, will depend on the Executives of Shows.

At the annual meeting of the Maritzburg Society—a report of the proceedings will be found elsewhere—the policy we advocate found favour, favour such as to warrant hopes that at no distant date the premier society of the Colony will adopt open judging. It is true that the

report of the Executive is non-committal, but as was pointed out by the hon. secretary, it leaned with favour to open judging—the class of judging we urge. Mr. P. D. Simmons, one of the most successful exhibitors in South Africa, spoke strongly in favour of Judges giving their reasons. Mr. Geo. D. Alexander, President of the Natal Farmers' Conference, also spoke to the same effect. The seed is now sown.

Our first remarks were limited to the educational aspect of the question, but, as was inevitable, side and subsid-

ary points were discussed in the correspondence. The important subject of the treatment of Judges and the defraying of their out-of-pocket expenses was dealt with in our last issue. Happily the point is a simple one which presents no difficulties. The question of Single Judges appears also to be in the same category; the general tone of the correspondence has been in favour of this system. This we consider satisfactory, for undoubtedly Single Judging makes for the end we have in view. In his excellent and very practical letter Mr. Theodore Woods supports this system; he considers that a Judge should be able to give his reasons if called upon to do so. Our sole aim is that of making the giving of reasons verbally or by points an essential feature of judging. For awarding prizes to the "best" animal among "general purpose" horses, or the best horse or cow in the yard, the number of the Judges, and even their qualifications, is a matter of no real importance. Judging is out of the question. A competition for the best among the eggs of turkeys, ducks, dorkings, and plovers is hardly more futile. In the matter of procrastination in the selection of Judges, and in the indifference as to their qualifications, several writers, and more particularly Mr. Dick, have made extremely apposite remarks.

Upon the question of condition in relation to quality, it is evident that even under the present system, what lawyers call a "ruling" is wanted. The general public lean to condition, and judging in England has for a long time given much consideration to this popular sentiment. Like many good things, however, it has been overdone; many authorities are now maintaining that what is called "Show condition," is the bane of Shows. Of arriving at that pitch of show condition there is little danger as yet in the Colony. The following quotations bear with interest on this subject:—

Rev. James Scott:—"I lay considerable stress on condition, having in many cases refused prizes on account of bad

condition. I cannot see that it is right to give prizes to those who, by their neglect, are deteriorating the cattle of the country."

Mr. James King:—"With live stock the difficulty is greatest, and often some of the best animals would lose their proper position as to merit when 'Show conditions' or 'get up' have to be taken into consideration by points; for instance, a bull may have been running at stud up to within a few weeks of a Show, and presents a generally rough and unkempt appearance, but otherwise of generally better quality than the fully groomed and perhaps coddled animal that carries off the premium. A popular win with the public, no doubt, but on the abstract question of real merit, a mistake."

Mr. William Woods:—"Some horses were brought on in the pink of condition and others quite the reverse. A good Judge would know that if the conditions were reversed, the low-conditioned horses would be by far the best. What is he to do? He has no accepted scale of points, allowing so many points for get up, etc., so he has to give the most unlikely looking horse the prize."

The foregoing views go a good distance to prove the necessity for what we contend—explanatory judgments. The Rev. Mr. Scott states plainly that he refuses prizes to better animals if their condition be bad. Mr. King says that the giving of the prize to an inferior beast if it is attractive in condition is "popular," and Mr. Wm. Woods says much the same, and avers that such judging is practically inevitable if the "point" system is not in operation. Exactly. Without explanation Show judging, as thus exemplified, may not only be non-instructive, but it may be mischievous in conveying wrong impressions.

Mr. Theodore Woods incidentally remarks:—"With regard to judging by points *versus* judging by comparison, the former has its disadvantage, in that it takes more time, and an animal with

exceedingly good points in one part and exceedingly bad ones in others (which throws the animal out of balance and renders him useless for the purpose for which he is bred) may score as many points as another which may be fairly good all round, although, perhaps in no part scoring top points."

The hypothetical case suggested by Mr. Woods, we think, should be of very rare occurrence, and we would add that however perfect the animal might be in detail, if he were disproportionate—if he were unsymmetrical—the application, and only the application, of the system of judging by points must be at fault. What would be thought of a statue of Adonis but with the head of a Jupiter, and the arms of a Hercules, all perfect in detail, yet in incongruity constituting what the stock-breeder calls a misfit. Shape, formation, or proportion go a long way in deciding the merits of every beast, and if that fact is ignored in any individual instances of judging by points, it proves that the principle of the system has been ignored by the framers of the scales of points.

Upon the question of classification our correspondents are unanimous. They recognise the difficulties of small Shows in this respect, but on the other hand they do not fail to point out the absurdities to which this absence of classification leads. The "general purpose" section for horses has proved of great convenience in the past, but closer classification is

now becoming possible. Of course, judging for a competition in which practically every entrant is of a different, or has the leading characteristics of a different breed, is not only impossible but is very possibly misleading. The decision will very probably be according to the Judge's personal predilections. The judging of "best" animals in a show yard, and, above all, the best animals fed or treated according to certain commercial specifics, calls for no serious comment. They are harmless but attractive additions to a Show. Mr. A. K. Murray took some exception to our word professional with respect to Judges. Possibly we should have done better to have hedged somewhat in using that expression, but it may be pointed out that "professional" is a word now commonly used in a very broad and elastic sense. In sport, the line dividing the amateur from the professional is thin to the last degree of tenuity. All that we wished to convey by the use of the word was the competence of a professional or expert.

It is a gratifying fact that with the important exception of Sir Thomas Murray, late President of the Maritzburg Agricultural Society, all our correspondents have written in favour of the views we have expressed. When next year's Show season arrives it is to be hoped that a practical outcome may result from the authoritative opinions which we have had the pleasure of publishing.

Passing Notes.

RAIN.—The dry season ended on the 26th ulto. The rain was of penetrating character, and during the two days on which it fell the rain gauges showed from a big inch downwards according to the wet and dry belts of the Colony. Those who place faith in rain cycles are predicting a heavy fall for the summer on which we are now entering. In England the summer now closing has been one of the wettest on record. Up to the middle of June there had been only four or five fine days, and many of the low lying parts

of the country were at intervals flooded. The annual military manoeuvres for the end of last month had to be abandoned on account of exceptional rains. When the Natal sky is day after day like brass and the earth is as hard as iron a yearning for a spell of the Old Country weather is natural, but for the enjoyment of life the spells would have to be limited in duration.

MOTOR CARS.—Before very long motor cars in some shape will be brought into the service of husbandry. At present

manufacturers are chiefly directing their attention to the requirements of wealthy people intent upon rapid and luxurious locomotion, but the needs of those who want cheap conveyance for heavy and bulky goods are sure to receive early attention. Vehicles for taking a load of four or five tons over moderately good roads are already in the market, but their cost is high—about £700 in England. In Queensland the Minister for Agriculture has received with favour a proposal to make some experimental purchases.

SHEEP DIPS.—We are in receipt of a pamphlet dealing with the effect of dips on wool. The author, Mr. S. B. Hollings, of Calverly near Leeds, England, appears to treat his subject with impartiality and ability. The lime and sulphur dip he unreservedly condemns. Lime, he says, makes wool brittle, stunts its growth, saps its elasticity, causes difficulties in scouring, and disqualifies it altogether for taking certain dyes. The common use of

this dip in South Africa, he says, lowers the price of all South African wools. Tobacco, he states, sometimes does not affect the wool one way or the other, but often it makes the wool quite unsuitable for working into bright light tinted fabrics. Carbolic dips, he affirms, if the smallest quantity of tar be present, are most injurious; they are only suitable when prepared by scientific manufacturers. He favours arsenical dips. In these dips, alkali—which in itself is very injurious—is used to produce arsenate of soda, and in order that no free alkali shall remain after the mixing in water it is practically essential that the compounding be done by scientific manufacturers. These are the dips preferred in Australia and Tasmania, the sources of the best wools. His views, which are given at great length, have, he says, the full approval of Mr. Walter Leach, F.C.S., expert chemist to the Yorkshire Woolcombers' Association, etc.

Government Dairy Expert's Notice.

MR. E. O. CHALLIS, the Government Dairy Expert, requests that he may receive early notice from those who may desire instruction in dairy work during the coming season. The applications will

be dealt with according to priority; and any requisition to make an extended tour in any particular District should be sent as soon as possible, in order to facilitate the necessary arrangements.

Butter Samples.

THE Rev. Mr. Scott, Impolweni, has suggested to Mr. E. O. Challis, the Government Dairy Expert, the advisability of offering to test samples of butter, and to publish the results in the *Journal*. This plan is practised by the *Scottish Farmer*, and apparently with much success. Naturally the number of Scottish dairy farmers is as legion compared with those of Natal, but all hopeful ideas for adding to the usefulness of the *Journal* are cordially welcomed.

All queries and parcels regarding which answers and opinions are desired, should be addressed to:—Dairy Expert, Department of Agriculture, Maritzburg. The samples will be judged by the following standard:—Flavour, 50; colour, 5; grain and texture, 25; dryness, 10;

style and neatness, 10—Total 100 points. Initials or pen-names such as "Beginner," "Heatherbell," "Young Colonist," etc., may be given.

The following is taken from the paper already quoted, and will serve to show the class of answer that may be expected. (the points vary somewhat from the standard adopted by Mr. Challis):—

Sample of butter from "Hawthorn."

If "Hawthorn" would wrap her butter in parchment paper instead of cabbage blades, which turn yellow after being pulled for one day, it would look much nicer. The butter itself is firm and dry, and the flavour fairly sweet. The scoring will run as follows:—Flavour, 42; colour, 8; grain and texture, 24; dryness, 14½; style and neatness, 6½—Total, 95.

A Cultivator Coupler.

IN this issue we give an illustration of a Cultivator Coupler. The Coupler is designed by Mr. A. H. Walker, High-flats, and in actual practice he finds it of great service. All mealie growers are now aware of the necessity for constant cultivation in order to get the best returns. The superseding of hand-hoeing by scruffing was an immense stride, and the Coupler should give almost double the results of that big stride. All required, is another cultivator and a native to hold it. Mr. Walker says that with his Coupler he can work among mealies four feet high. To get practically double the work done—we are

assuming in these remarks the use of two oxen—when a flush of weeds is just making its appearance, or when the surface of the soil is one unbroken cake as the result of a heavy thunderstorm, is an advantage of no small moment. The width between the rows should, of course, be that of the distance the mealies are planted apart. For the disselboom, Mr. Walker uses a gum pole four inches thick at the butt and three inches at the front. The expense of the Coupler to those who have a scrap heap and a forge should be nothing in cash.

Breeding and Treatment of Dairy Cattle.

THE following is taken from an article on the above subject by Mr. W. Smith, Manager, Yangan Cheese Factory, Queensland.

IMPROVING BREEDS.

The question of heredity, as epitomised in the word "pedigree," is of the greatest possible importance in the art of breeding, improving animals of any kind. Heredity includes good and bad qualities alike, which are transmitted from parent to offspring, and the art of breeding consists quite as much in wiping out bad qualities as in developing good ones. A fault of form, for example, which is hereditary in any given cow, may be improved away by mating her, and also her female offspring through several generations, with bulls bred from families of cows in whom that particular fault does not occur. Faults, too, of colour, of constitution, of size, of bone, of milking properties, or of almost anything else, save, perhaps, of actual and positive organic diseases, may similarly be established by breeding against them through several generations. But at the same time it must be borne in mind that while these faults cannot be considered as having been finally wiped out until three or four generations have shown no

tendency to revert to them, it is only too easy to reintroduce them by using a bull from a herd in which they still exist. There is, unfortunately, a tendency to return to bygone types or peculiarities many of which, if not all, are undesirable, and a breeder cannot be sure that he has completely mastered it until he has seen no evidence of it in the last three or four generations of his cattle; even then it requires to be guarded against just as carefully as it was fought against, in order to prevent its reintroduction.

It has been found by Charles Darwin, the greatest naturalist of all time, that cross-breeding gives a more or less definite impulse towards characters long before lost or got rid of, and the introduction of fresh blood, especially if it be entirely unrelated, though of the same species or breed, may be easily followed by the restoration of some earlier and improved type. This is the danger which breeders have sought to avoid by breeding in and in, as the constant mating of closely-related animals is termed. But while there can be no doubt of the success of this line of breeding in the object desired, there is the danger of infertility and tuberculosis if the line be followed very far.

PURITY OF THE BREED.

But on the other hand, purity of breed may be maintained without necessarily increasing the danger of developing disease and destroying fertility. Fresh blood repeatedly introduced is necessary in order to avoid the danger spoken of, but it must be blood of the same strain and tribe if purity of breed is to be preserved. The danger only exists when closely-related animals—males and females of the same herd or family—inter-breed generation after generation, to the exclusion of outside relations. But in most of our distinct breeds of cattle, and particularly in the Shorthorns, there are many purebred herds of one particular strain or other—of Booth or Bates blood, for example—and these herds can supply to each other all the fresh blood that is necessary to preserve the vigour and soundness of cattle. And, indeed, if such fresh blood of the same strain be introduced from other soils and climates, and even from other countries rather than from the same neighbourhood, the benefit will or may be all the greater. But in any case, it is generally an advantage to get bulls from the south. Most of our various breeds of cattle have now been bred towards a given model for each breed, wherever any pains at all have been taken. The approved model of a Shorthorn, an Ayrshire, or a Jersey, for instance, is well understood, and all breeders of note have aimed at this model, so that there is no great difficulty in getting all the fresh blood required without incurring danger to the model.

A GOOD BULL.

It has been truly said that the bull is half the herd, and it is therefore of the greatest importance that only good bulls should ever be allowed to propagate the species. But what is a good bull? A well-formed, well-grown animal, of good colour and constitution is not by any means necessarily a good bull, though a good bull must possess these qualities. The capacity of a bull to transmit to his offspring his own peculiar properties or

mould of excellence of any kind, depend on his having inherited them from a succession of ancestors endowed with similar characteristics. There is many a good-looking bull not true bred as to qualities, whose power of impressing his good looks or other points of merit on his offspring has been found false, and this for two reasons—namely, his lack of prepotency, and the fact that his own ancestors have been bred in the happy-go-lucky manner, so common in the country. Such a bull, if he has a promising appearance, is, so far, a fortunate accident of Nature, but there is no certainty whatever that his offspring will be as good-looking as he; the certainty, indeed, is that he will not, if there is any certainty about it. On the other hand, it occurs often enough that thoroughly well-bred bulls, and cows too, do not show up as well as they ought, or as they were reasonably expected to do, and so far are not ornaments of the families to which they belong. Yet animals like these are always worth buying at the moderate prices to which their want of good looks has consigned them. They are worth buying, because their want of good looks, being merely an accident of Nature, they will in all probability produce offsprings much better looking than themselves. This sort of reasoning is applicable not only to looks, but to qualities, too, as a general thing. The rank and file of dairy farmers cannot well afford to buy the good-looking young bulls that fetch fancy prices, or used to fetch them, and indeed they may rest content as a rule with the plainer sires, for these will probably nick in with their cows just about as well as the others. But in respect of either sort, it is a "*sine qua non*" that the bull should have a healthy and vigorous constitution, and not have been pampered or coddled at all, but just brought up on plain food, and in a hardy sort of way as to general treatment. In any case the greenhouse way of rearing young bulls is played out, once and for all, so far as practical dairy farmers are concerned.

PEDIGREE BULLS.

The sort of cows that dairy farmers should aim to breed are they which possess milk, size, condition, and good looks. These are the qualities that command a good price in the market, and dairy farmers must needs be always breeding and always selling. Pedigree herds are the "upper ten" of bovine society, and dairy farmers who are in business for profit and not for a hobby cannot afford to have much to do with them. Indeed, pedigree bulls are sometimes a delusion and a snare when brought into an ordinary herd. I have known two marked instances of this. One of these bulls got very few calves, and those not very good ones; others got plenty—too many in fact—and scarcely any of them were equal to their mothers. This last one, indeed, very seriously lowered the quality of a high-class non-pedigree herd, which belonged to an old friend of mine who is now gathered to his fathers. But, on the other hand, I have known a case where a pedigree bull had qualities so marked and commanding that his impress was clearly enough seen for many generations among the cattle of the neighbourhood. All this is a lottery, as matrimony is said to be. It would, however, be much less a lottery if those who buy bulls, be they pedigree or not, would take sufficient pains to assure themselves that the qualities they want in the bulls are hereditary, and not merely accidental. In order that the bull may improve the herd, he must needs come of a family which has long been noted for soundness and vigour of constitution, otherwise he will not influence the offspring very much to their advantage. But if he possess that strength and soundness and vigour, his influence will be seen in many generations. This, indeed, is prepotency, and comes, like other functions, within the meaning of heredity.

CROSSING.

The offspring of a cross between two animals of the same breed, but not of the same family, or even related in blood, is

generally strong and vigorous, sometimes more so than either of the parents, whereas, on the other hand, close-inbreeding tends towards delicacy of the constitution, and weakens some of the functions. From this latter condition of things it is easy to develop the disease known as tuberculosis. This, however, is not exactly "crossing" in the ordinary acceptance of the word. Intercourse of a sexual nature between animals of distinct breeds—as between Shorthorns and Ayrshires, or Ayrshires and Jerseys—is essentially crossing, and the offspring of a first cross of this sort is usually a most vigorous and healthy animal, if neither of the parents is diseased. In any case, the breed from animals that are diseased or unsound in any respect is, to put it mildly, a mistake. Such animals should not be allowed the opportunity of procreating, for unsoundness is distinctly hereditary, and disease in a parent will commonly reappear in offspring.

It seems to be well established that Nature looks with approval on blood-mixing within the limits of a given species, rather than on the family exclusiveness which in the breeding of pedigree stock, has been too frequently promoted. This refers to the animal world in general, including man himself. How far the greatness of the British race is due to the fact that Saxon and Norman and Dane are we, as Tennyson puts it, I will leave others to say, but the fact remains that as a nation we are considerably mixed in blood. This suggestive illustration may serve as a point of study in the breeding of domesticated animals, and I may refer to the Shorthorns by way of analogy. One of the most successful dairy farmers I have known followed a plan of breeding which is worth relating, and found it answer his purpose thoroughly well. He never bred any cows for his own dairy, but bought as many promising heifers as he wanted, of the ordinary Shorthorn breed, year after year, and had them put to a pedigree bull. This bull was always a thoroughly good one, but as a matter of preference did not

come from a milking family. This prepotency showed itself in the calves, which ran to beef at an early age, and were almost invariably fed off for the butcher while still they had their calf-flesh upon them. This sort of thing cannot be generally followed, we know, but it is an instance, remarkable in its way, of breeding for a special and intelligible purpose.

When it is desirable to feed off animals in this way for the butcher, it would be false policy to let them lose their "calf-flesh," as it is termed—that is, these young animals ought to be kept steadily and rapidly progressing towards maturity from their birth. And when female calves are reared for the dairy herd, it is also advisable to keep them steadily progressing, but not so rapidly as in the other case. There is, and can be, no advantage whatever deserving the name in letting young store cattle down into the lean, half-starved, unprogressive condition which is far too common in the land. The true and sound policy is to keep them thriving all the time, rapidly when for the butcher, and slowly when they are for the herd.

GENERAL TREATMENT.

We may say, then, that if cows are exposed to bad weather of any sort, particularly to cold and combined with damp, a waste of food is involved; so also if they are chased about by dogs, or flies, or men, or if they have to travel too far in search of food and drink. All is done at the cost of food, for the consumption of carbon is excessive in these cases, and the cow will lose flesh and give less milk, the quality of which will be reduced, if she is not treated upon what are called humanitarian principles. A cow that is starved of food or deformed by dripping rains, and withered by a frost, cannot be said to have even common fair-play, but can do but little credit to herself in the way of yielding a profit to her owner. Instances may easily be found in every district showing the effects of feeding and treatment of dairy cows.

We may see a prosperous man who, in feeding his cattle well, enriches his land; the land responds to this, and, in turn, feeds his cattle more liberally, maintaining a larger number of them than it would at first. In another we find lean cattle and impoverished land, which lead in the end to poverty. I knew a man once who was notorious for starving his cattle and neglecting his land, though he was the owner of both. If he ever bought food for his cattle, he did it so by stealth, for nobody heard of it. His cattle were so lean and weak in the winter that they could hardly get up without help, and sometimes couldn't with it; his land got no help, and it starved his cattle in summer; his fields threw a scanty crop that was deficient in nutriment and so forth. Well, this man never prospered, never flourished, and he died as he lived, in something very like poverty, which might just as well have turned to plenty.

Lastly, there is the question of gentleness in the treatment of cows. There are, indeed, few cows who are not susceptible to treatment of this sort, they become gentler themselves in response to it, and yield more milk. Cottagers' cows generally do better for their owners because they are commonly tended by women, and women, as a rule, are gentler and kinder than men. A man who kissed his cow has been often cited, and the Austrian Hussar his horse; these kisses matter but little in themselves, but they are the outward and visible signs of inward and spiritual kindness and gentleness. These it is that are so beneficent in the treatment of cattle.

Steps are apparently being taken in British Guiana to start the cotton industry among small cultivators. The *Demerara Argosy* of June 20, states that Mr. Bruce-James, the Agricultural Instructor, recently visited the Burton village taking with him a large quantity of cotton seed for distribution. In the course of his address to farmers in that district, Mr. Bruce-James recommended the formation of a local joint-stock company to purchase their own ginning machine, and advised growers to ship their produce direct to the home dealers and to avoid the middleman as far as possible.





THE NATAL VICTORIA ORANGE.

(See Interview with Mr. D. Brown, J.P., No, 12, Vol. VI.)

The Culture of Eucalypts.

By T. R. SIM, F.L.S., Conservator of Forests.

(Continued.)

EUCALYPTUS LEUCOXYLON, F. v. M.

SOUTH AUSTRALIAN BLUE GUM.

A frequent tree both in Kaffraria and in Natal, doing well in each, from the coast to between 4,000 and 5,000 feet altitude. Easily cultivated, but apt to lie flat on the ground during the first year, a copice shoot then taking the permanent lead. This species and *E. sideroxylon* were formerly regarded as forms of one species, and records regarding the timber include both forms together. The high value for strength, hardness and durability of *E. sideroxylon* is well known even in Natal, but from Australian advices it would appear that *E. leucoxylon* is equally valuable for wagon-wood, railway-sleepers, and underground mining work. A safe tree to grow on almost all soils and in most localities in Natal.

EUCALYPTUS LONGIFOLIA, LINK.

WOOLLY-BUTT.

Rather a slow growing tree, of ornamental pyramidal shape, and profuse white bloom; only a small tree on shallow soils, but occasionally doing well on deep alluvial soil. Common in Natal; some trees on Mr. Topham's estate at Umsindusi are 80 feet high and 12 inches diameter, with clean, upright, unbranched trunks; others near the coast at Ottawa on cold clay are almost as good as *E. tereticornis* of same age. Coming from Eastern Australia it should naturally succeed here; it also does fairly well both in the Eastern and Western Provinces of Cape Colony.

The timber is heavy and durable, but apt to be streaked with resin.

EUCALYPTUS MACRORHYNCHA, F. v. M.

VICTORIAN STRINGY-BARK.

Grows rapidly into clean straight poles, producing strong easily split timber, not,

however, very durable in the ground. It grows well in Natal and Kaffraria, and can be recommended for ornament and shelter purposes, but less where durable timber is desired.

EUCALYPTUS MACULATA, HOOKER.

SPOTTED GUM.

A tall tree, branched upward, well adapted for cultivation in the lower parts of Natal, but seldom seen there. Does well at King William's Town. The timber is recommended for waggon-work, cart shafts, ship-building, &c., and is said to be durable and easily split.

EUCALYPTUS MARGINATA, DON.

JARRAH.

Coming from near the coast of South West Australia, where it gets winter rainfall and hot summers, this species is naturally not in its proper habitat in Natal with its dry winters and showery summers. And its behaviour shows that the climate does not suit it, for though trees have been repeatedly tried I have not yet seen a tree of more age than a few years. In Kaffraria the same result was experienced, trees doing well for a few years, but gradually dying out without apparent cause. In the neighbourhood of Cape Town, where climatic conditions resemble those of its native habitat, it is said to be doing well, but in California McClatchie writes:—"In California the Jarrah does not thrive at or near the coast. In interior valleys having moderate aridity and heat it does some better, but at no point in America where it has been set does it grow with sufficient rapidity and vigour to warrant planting it for commercial purposes."

Jarrah is considered one of the most durable of timbers, both for railway and harbour work, and is largely imported for these purposes, but it is one which cannot reasonably be expected to succeed in

Natal, where other equally durable timbers, which do succeed, such as the Iron-barks, will have to take its place when the present West Australian supply becomes exhausted. At the Railway Nursery at Inchanga Jarrah mostly dies out before it gets past the nursery stage.

EUCALYPTUS MELLIODORA, A. CUNN.

YELLOW BOX.

A slow-growing rather bushy tree, giving a distinct feature in ornamental planting, but not suitable for culture for timber. In East Australia, where it is indigenous and of good size, it is considered a valuable timber, but other kinds are better adapted for timber-culture here.

EUCALYPTUS MICROCORYS, F. V. M.

TALLOW-WOOD.

Not grown in Natal meantime, so far as I know, but climatically adapted for growth, and of considerable timber value. The timber is of a greasy nature, it is consequently waterproof, and durable in the ground. Mueller states:—"The timber is hard, durable even underground, and is employed for railway sleepers, wheelwrights' work, knees and breast-hooks in ship-building; used with advantage and preferentially for wood-bricks in the City of Sydney; the young trees serve for telegraph poles." Maiden supports this, saying:—"One of the least liable to shrink of all our hard-woods. It is heavy, strong, and durable. It may be planed and turned with great satisfaction. It is not easily split, the greasy substance contained in it making it a tedious matter to get the wedge to 'draw.' I would express the opinion that after Ironbarks, Tallow-wood is the most valuable of our hardwoods."

EUCALYPTUS MICROTHECA, F. V. M.

THE COOLIBAH.

Another species not yet tried in Natal, but, as it belongs to the hot dry deserts of the interior of Australia, it is at least worth trial in similar localities here. Timber used for furniture, piles, bridges, and railway-sleepers.

EUCALYPTUS OBLIQUA, L'HER.

TASMANIAN STRINGY-BARK.

A tree of easy culture in Natal, growing to a large size quickly. Like other Stringy-barks, the timber of this kind has high technical value for work where durability in the ground is not required; it is straight and splits easily, and where naturally abundant grows to an enormous size, and is used for a vast variety of purposes, including piles and sleepers. The growth of this species for these purposes cannot, however, be recommended, especially where other more durable and equally valuable kinds can be grown as easily, but for ornamental purposes and the production of timber for in-door work it is suitable.

EUCALYPTUS OCCIDENTALIS, ENDL.

FLAT-TOPPED YATE.

Not seen in Natal, but in Kaffraria trees on deep alluvial near King William's Town were 60 feet high and 12 inches diameter in ten years, while at Fort Cunynghame on shallow sandy mountain soil the growth was miserable, and the tendency to flower early very pronounced. Mueller states:—"The timber is hard and strong, thus sought by wheelwrights, and probably as valuable as that of *E. cornuta* (the ordinary Yate), to which it is closely allied. Worth trial in lower Natal."

EUCALYPTUS ODORATA, BEHR.

ONE OF THE BOX-TREES.

This species is closely allied to *E. melliodora* and also to *E. hemiphloia*; it grows more rapidly and larger than the former, and less rapidly and smaller than the second. There are several large old trees of it in Natal, and in Cape Colony there are many at Cathcart, all good trees but inclined to branch where widely planted.

In Australia it is said to occur on limestone as well as on clay, and to have hard very durable timber, used for sleepers, posts, and piles.

EUCALYPTUS PANICULATA, SMITH.**WHITE OR GREY IRONBARK.**

Concerning the value of different Ironbark timbers, see notes under *E. crebra*. That of *E. paniculata* is placed first in importance by Maiden, who also states:—"It is to White Ironbark of good quality that all the encomiums which have passed on Ironbark may be attributed. At the same time, timber but little inferior may be produced by some of the other Ironbarks." Mueller says:—"It furnishes a hard durable wood, excellent for railway sleepers. It is also much used for building and fencing, as it is lasting underground." This species, in addition to the above common names, is also sometimes known as "Red Ironbark," a name more usually given to *E. sideroxylon*. In both species red timber is not an unusual colour, though in *E. paniculata* there are forms having white or grey timber. *E. paniculata* grows freely in alluvial or deep land in Natal, especially in the Middle Districts, but on poor and shallow soil it becomes of less size, while in Australia it has a tendency on such soil to become a Mallee scrub, and is then without value. On proper soil, however, it is one of the most valuable timbers to grow in Natal, and as it is easily grown, being hardy and good at enduring difficulties in its nursery stages as well as afterwards, this is one of the species which should be most extensively cultivated.

EUCALYPTUS PAUCIFLORA, SIEBER.

One of the most hardy Eucalypts, growing freely in exposed situations in the Orange River Colony, and at Hanover, Dordrecht, etc., in Cape Colony. In Natal only poor specimens near Maritzburg have been noticed. It is naturally a small tree, with comparatively worthless timber, but it endures where no other Eucalypt does, and consequently has a value for certain situations. In Natal better kinds can usually be substituted. *E. coriacea*, A.C., is a synonym.

EUCALYPTUS PILULARIS, SMITH.**THE BLACK-BUTT.**

An ornamental and useful species, growing eventually into a very large tree.

Many fine specimens occur in Natal, usually as single trees, and consequently much branched. Trees at the Hilton Road Wattle Plantation 10 years old are 60 feet high, and have clean straight boles 12 inches diameter. The foliage is usually horizontal and ample, making it a good shade tree. It belongs naturally to the humid regions near the coast of Eastern and Southern Australia, and enjoys heavy summer rainfall. When young it is liable to damage by frost, and in after years suffers if in dry shallow soil, or above an iron pan. At East London it failed on the sands of the coast dunes, and in various situations has shown that its requirements need attention, but that it does well where conditions are satisfactory. Maiden states:—"This is one of the best hardwoods we have for house or shipbuilding. It is useful for bridge planking, though inferior to Tallow-wood for that purpose. It has been tested for many years for blocks for wood-paving, with most satisfactory results; in fact it is one of the best timbers we have for the purpose, both as regards wear and durability. It takes tar well. After Ironbark, I would only place this timber second to Tallow-wood, amongst our hardwoods, for general purposes."

Mueller says:—"Timber much used for flooring-boards, also for railway-sleepers and telegraph poles, and for wood-bricks in street paving in Sydney. Weight of a cubic foot of absolutely dry wood from 50 to 56 lbs."

EUCALYPTUS PIPERITA, SMITH.**PEPPERMINT STRINGY-BARK.**

A tall, mostly unbranched tree, not common in Natal. Like the other Stringy-bark trees, its timber is not durable in the ground, so its culture can only be recommended for ornamental purposes, or for indoor timber.

EUCALYPTUS POLYANTHEMA, SCH.**THE RED BOX, OR DEN-TREE.**

Usually a medium-sized much-branched tree with abundant foliage, and consequently a suitable tree for street

tree-planting, but if closely grown or trimmed up, it makes a good clean stem of fair height and fairly rapid growth. It continues to keep alive in very dry and unpromising situations, but it responds readily to good soil and abundant moisture. Mueller states :—"A tree attaining a height of 150 feet ; it furnishes an extremely hard and lasting timber, in great demand for mining purposes and railway-sleepers ; also for wheelwrights' work. For fuel this wood is unsurpassed. It is extremely strong, excelling oak and ash, surpassed among Eucalypts in transverse strength, according to our experiments, only by *E. leucoxylon* and *E. siderophloia*."

For economic purposes its growth in Natal is too slow, except on good deep land.

EUCALYPTUS PUNCTATA, D.C.

LEATHER-JACKET.

A tree of large size and rapid growth in the Midlands, but rather apt to produce heavy branches when widely spaced. Closely allied to, and not always easily distinguished from *E. resinifera*. Maiden speaks highly of its timber, and Mueller says :—"The wood is of a light-brown colour, hard, tough, and very durable ; used for fence posts, railway-sleepers, wheelwrights' work, also for shipbuilding."

EUCALYPTUS RESINIFERA, SMITH.

RED MAHOGANY.

One of the most common and most rapid-growing Red-gums of Natal. It varies immensely, and may be said to merge gradually into several other species. It is only half-hardy, for it suffers much from the cold dry winters of the uplands, but delights in the mists and summer rains of Mid-Natal, and also does well towards the coast. As a single tree, this species usually does well, but in plantations it is so liable to occur in many varieties together (apparently hybrids), that a few strong plants usually dominate all their neighbours.

Authorities agree on the value and durability of the timber, though, from

local experience, it would appear to me that the tree requires to be fully matured before its durability is developed. It grows rapidly into a large tree, often much branched. Mueller states :—"A superior timber-tree, of large size. Wood much prized for its strength and durability. Used in Sydney for wood-bricks, also particularly good for fuel." And Maiden adds :—"Of a rich red colour. Very durable, and becoming very hard with age, even as hard, or harder than Ironbark. Resistant to white ants, and does not discolour paint. For general building purposes and for fencing it is a very durable timber. It is an excellent timber for wood-paving. . . . Red Mahogany is often sold as Jarrah, which it closely resembles, and for which, I believe, it is a perfect substitute. . . . It is of a handsome colour, and works up well. It may be recommended for large turned work and for heavy furniture. It is useful for weather boards." Concerning its requirements, McLatchie states :—"The Red Mahogany grows quite well in the coast regions of California, but does not thrive in the dry interior valleys. It does not resist severe frost, nor does it endure high temperatures in a dry atmosphere. It is well suited to moist, semi-tropical climates, being confined in Australia almost exclusively to the warm coast districts."

EUCALYPTUS ROBUSTA, SMITH.

SWAMP MAHOGANY.

One of the most common and best known Gums near Durban and along the coast, where in moist soil, and even on banks through swamp it does well, producing a heavy dense dark-green foliage, but on light soil overlying shale it is usually a failure. Inland it is only successful on deep soil and in humid surroundings, but is not tender to frost, and there are a few fair trees high on the Drakensberg. It has a decided tendency in all unsuitable localities to flower and seed too freely at an early age, and practically stop growth there. In such cases, self-sown seedlings are abundant, but are

rather an endeavour to maintain life than an evidence that the species is successfully naturalised. The branches are rather brittle, and apt to be broken by wind. Mueller states:—"The wood is remarkably durable, reckoned a fairly good timber for joists, also used for ship-

building, wheelwrights' work, and many implements, for instance, such as mallets."

This species should do well in lower Zululand.

(To be Continued.)

City Agricultural Society.

ANNUAL MEETING.

PRESIDENT'S ADDRESS.

The annual general meeting of the Maritzburg Agricultural Society was held on the 28th ulto. at the Town Hall. Sir T. K. Murray, president, was in the chair, and the other members present were: Messrs C. Holliday, Henry Fell, J. E. Potterill, T. Hyslop, John Moon, P. Otto, D. C. Dick, O. Hosking, H. Turner, W. H. Buchanan, Geo. W. Macdonald, H. Loader, J. Campbell, F. G. Burchell, W. M. Cameron, Jas. Norton, R. H. Pepworth, P. H. Taylor, W. P. Gough, R. S. Simpson, T. Lawes, A. Otto, Chas. W. Holmes, R. Mason, A. B. Ashton, G. D. Alexander, K. K. Hathorn, K. C. S. J. Mason, H. V. Marsh, Geo. Goodwin, M. A. Sutton, E. O. Challis, W. J. O'Brien, F. P. Woodhouse, B. Ireland, J. Finn, Stephen Bell, E. G. Mendenhall, J. T. Guttridge, H. J. Stutno, P. D. Simmons, and James Hall.

COMMITTEE'S REPORT.

Your committee have pleasure in reporting on one of the most successful years the society has had. Our financial position has been greatly strengthened by the success of the last show, a success which, while it justified the expenditure on the new ground, has also shown that even yet the accommodation is not sufficient for the certain expansion of the future. The entries for the last show numbered 1,851, by far the largest entry in our history. In quality, also, there was a distinct improvement almost all round. It may be worth while quoting a few of the remarks made by the judges in their lists. Speaking of the South African bred grade cows, the judge says, "A very fine lot"; of the South African bred heifers, 3 years and under, he notes, "A very fine exhibit in the whole class." Referring to his class, the judge of Devons writes, "I wish to ex-

press the great improvement in the Devon cattle shown as to quality, condition, and get up." On the other hand, the smaller classes of Kerry and Channel Islanders call for some unadvised versions on the part of the judge, the latter especially being poorly entered, and, as a whole, in bad condition. The sheep, poultry, and dog judges make no remarks, but the judge in the apianian section says, "I consider the exhibits form the best show of apianian products yet seen in Natal." A subject of general remark was the fine appearance of the showyard. The new hall, taken over on the 30th May, gave a finish to the general scene, and the trees planted about two years ago, all well-grown and in good foliage, completed the effect. Your committee have to recommend certain additions and improvements. Scarcity of funds prevented the asphaltting of the floor of the hall. This would be a great advantage, and your committee recommends that it be done. To make the grand stand of proper value to those who pay for admission, the ground in front was fenced off, and it has been decided to plant this space with running grass. A suggestion was made at a committee meeting that the oval should be planted with running grass, but no decision was come to. It was found that the lock-up stalls were too few, so these should be added to. The success of the tradesmen's stalls was so great, and this feature of the show is so promising of future expansion, that your committee believe the number of stalls should be increased and improved by some device to give shade; and also that a prize be offered for the best got-up stall, and another for encouraging enterprise in colonial industry. It was decided to paint all the woodwork in the yard, and this

work is now in progress. A band stand is wanted to complete the yard, but the committee had scruples about spending the society's funds for an erection which, to be in keeping with its surroundings and its purpose, will be expensive. The tea-rooms require extension, and a luncheon room is also necessary. Your committee recommends that these be provided. Your committee recommends a few alterations in the prize list for next year. It is proposed to add classes for kohl rabbi, kafir corn, wattle bark, etc. Complaints have been made that the pen of three hens and a cock required in all poultry competitions is too large, and it is suggested that classes be arranged for single birds. In connection with the compilation of the poultry section of the prize list, the assistance of the executive of the Poultry Club has been asked, and similarly in the dog section the committee hope to receive the co-operation of the Kennel Club. The produce (grain) judge recommended that separate exhibits should be entered for special prizes in the produce section. Your present rule reads thus: "No animal, pen of animals, or article can be entered for more than one prize with the exception that when a special prize is offered an exhibit entered to compete for one of the society's prizes shall be permitted to compete for the special prize." Your committee agrees with the recommendation of the judge, and suggests a modification of the rule as follows: "No animal, pen of animals, or article, can be entered for more than one prize, but in all sections, except the produce section, when special prizes are offered, an exhibit entered to compete for one of the society's prizes shall be permitted to compete for the special prize. For special prizes in the produce class exhibits other than those entered to compete for the society's prizes will be required, etc." It is suggested that in the mealie classes only one bag instead of two should be required for the society's prizes, and the committee recommend the adoption of the proposal. As the show increases in size and importance, it becomes more difficult to obtain the services of competent judges. In the past the society has been singularly fortunate in its judges. The gentlemen nominated to the positions have always acted with willingness and competence. At last show, however, the election of judges was rendered difficult by the fact that several gentlemen chosen excused themselves on the ground that they were themselves to be exhibitors, and they felt that, under the circumstances, they could not act as judges. To obviate all difficulties of this kind your

committee have discussed a proposal to form a Judges' Association for the whole colony, the members of which would be all the agricultural societies and associations holding shows. To a committee of this association would fall the duty of nominating qualified judges for the different sections of competition, and societies holding shows would be expected to choose their judges from the list so compiled. On this subject Mr. D. C. Dick, your yard steward, writes as follows to the "Agricultural Journal," and the views expressed are approved by the committee:—"I think that some move should be made by the agricultural societies to establish an 'Association of Judges of Stock and Produce,' and that, before any individual should be allowed to become a member of such association, he should be approved by a committee (consisting of a delegate from each agricultural society in the colony) as a fit and proper person, capable of performing the duties of a judge in whatever class he may prove to have a knowledge of. If such a measure could be adopted, we could then have a list of judges from whom we could select, and thus avoid appointing local men; and the least we could do in return for the services of such men would be to pay all expenses of attending shows, and a nominal fee as well. Later, we could try and come into line with the Home societies in our system, and institute out-and-out open judging, which, I feel assured, would meet with general approval at the hands of all interested in agricultural shows." A delicate question has occasionally arisen about the advisability of judges giving reasons for awards. It has happened that a false opinion of the value of an animal, from a show point of view, has been corrected by a judge's explanation. On the other hand, to give exhibitors a right to call for such reasons would immeasurably increase the already hard work and great responsibilities of judges. With a Judges' Association, and the greater probability of common standards of judgment occasioned thereby, this difficulty might be either removed or properly met. A surveyor is now employed making a plan of the yard, showing all buildings, stalls, benches, and spaces. This will be copied in prize lists and catalogues for the convenience of exhibitors. In future the catalogue will be printed as it was for last show, without advertisements, except on the covers and tops and bottoms of pages. It is recommended by the committee that late entries be abolished. During the year 20 meetings of the Executive Committee were held, and two meetings of the General Committee.

TREASURER'S REPORT.

The following extracts are taken from the report of the hon. treasurer (Mr. C. Holliday):—

Before placing my report before you, I would draw attention to the rules of the society, wherein it is provided that the statement of the finances of the society shall be sent to each member along with the notice of the annual general meeting, at least 14 days prior to the meeting. No doubt it was easy enough to manage this when the show was held in May, but the holding of our show in June throws the work so much later, and the great increase in entries at our last show have entailed so much labour, that I have to bring up the accounts without the usual auditor's report. I would therefore ask the meeting to accept the statement subject to audit. There is no doubt the time has arrived when the secretarial and financial duties should be discharged by a paid official. The increasing importance of the affairs of the society demand that they should be entrusted to someone who is not honorary, and who can, therefore, be called on in the same manner as the secretary of a company. With this object in view, the incoming committee should be empowered to appoint a secretary, who will discharge the whole of the duties now carried out by the hon. secretary and the hon. treasurer. In presenting my report for the past year, I must congratulate the society on the splendid position in which it now finds itself. The balance of assets over liabilities is £9,400 19s. 9d., as against £8,476 17s. 11d. for the previous year, and £2,723 1s. when I took over office in 1900. This represents a profit on the year's working of £924 1s. 10d. The building of the hall necessitated the calling in from time to time, as occasion required, of the amount temporarily invested. There is, therefore, no amount out now on this head. Although I should like to have seen a redemption of some of the debentures, I am afraid the incoming committee will have to take in hand the erection of new offices, so that the whole of the new building may be used as a produce hall. With a view to providing funds, I would suggest the holding of quarterly gymkhanas in the yard, on the lines of the competitions held on the third day of the show. The incoming committee will have seriously to consider what is to be done between the shows with the valuable property we have acquired. I cannot help thinking that small special shows, held on the lines of those of

some of the English agricultural societies, would not only prove a financial success, but keep up the interest in the society. With this object, I would recommend the consideration of a project for lighting up the yard by electricity. In addition to the use of it for the small shows indicated, I feel sure an evening fête during the show would pay handsomely. It will be remembered that many years ago a special wool show was held. I have no doubt other seasonable exhibits might be combined with wool, and make a very good and interesting exhibition. A yearly industrial exhibition would also prove a good financial venture, especially if held on a public holiday, on which day jumping or other competitions could take place on the oval to draw the public to the grand stand. I would impress on the new committee to take some means to use the yard more; it will not only benefit the yard, but also the finances of the society. The extension of the show to a third day has proved a great financial success, but I recommend to the consideration of the new committee the advisability of spreading the competitions over the three days so that we may have something to draw the public to the grand stand on the first day. As before mentioned, the balance in favour of the Society on capital account is now about £9,400; to this ought to be added the value of the land, which is held by the Corporation for us in terms of law, so that really the position of the Society, adding the value of its property, would show about £20,000 to the good, and it affords me great pleasure to hand on to my successor the financial affairs of this truly colonial institution in such a satisfactory state.

The President, in moving the adoption of the report, remarked on the departure that had been made. Previously the annual report had been presented by the president, but this year the report was made by the Executive Committee. They would notice also that there was no reference in the report to political matters, as was usually found in the president's report. The society was certainly not a non-political one. They were very grateful indeed for the very fine list of special prizes they received last year, and several members of the executive had worked very hard in getting those prizes. The society was under a debt of gratitude to them, and he hoped that the donation of special prizes would continue in the same generous manner. He had made up his mind not to contest the presidency of the society this year. For eleven years, more or less, he had held

that office. He had decided to remain in the position until the society had been brought through its troubles and was thoroughly established in its new ground. That had now been accomplished. As he had previously stated, he thought it was only right and fair that other members of the society should have the chance of becoming president of the society. Their secretary had also intimated that he did not intend to carry on the secretarial work of the society; in fact, he had adopted that attitude for many years. Last year they started to initiate new secretaries, so that they might be thoroughly competent to carry on the work. The society was under a debt of gratitude to Mr. Whittle Herbert for the many years of hard work he had rendered. (Hear, hear.) The assistant secretaries were doing their work in a thoroughly satisfactory manner.

Mr. P. D. Simmons seconded the motion. He thoroughly supported the proposition that judges should be expected to give their reason for their awards, for the education of the exhibitors. He eulogised the services rendered by the honorary secretary, and hoped they would at a later date be able to prove their appreciation of his work.

APPOINTMENT OF JUDGES.

Mr. G. D. Alexander spoke of the difficulty of getting judges, and he questioned whether they would be able to get judges to submit themselves to the risk of being black-balled. He thought they should try to get judges from outside the colony. There was a great deal of jealousy and a considerable amount of disagreeableness in connection with getting local judges. The prizes of the society should carry the merit that the animals getting the prizes were really first-class animals. That was not the case at present, as in many cases prizes were awarded simply because the animals were the best in their class. He supported the idea that judges should give their reason to exhibitors for their awards, but he did not think it would be practicable.

Mr. Hathorn thought the office of president should not be held for more than two consecutive years by one man.

The report was adopted unanimously.

TREASURER'S REPORT.

The Chairman moved the adoption of the report of the hon. treasurer.

Mr. G. D. Alexander seconded, and complimented the treasurer on his lucid

report, which he said was most satisfactory.

The report was unanimously adopted.

Various suggestions in regard to the arrangements at the showyard were made, and referred to the consideration of the committee.

ELECTION OF OFFICERS.

The election of officers was then proceeded with, and resulted as follows:—President, Mr. Cratt; vice-presidents, Messrs A W Herbert, O Hosking, D C Dick, P Otto, and J F Potterill; hon secretary (pro tem), Mr D C Dick; hon treasurer (pro tem), Mr Cecil Holliday; auditor, Mr Lambert; committee, Sir F K Murray, K.C.M.G., Messrs C Holliday, F G Burchell, Jas Hall, G M Macdonald, F W Jameson, J Moon, E O Challis, Henry Fell, G D Alexander, Thos Hyslop, F P Woodhouse, E M Greene, S J Mason, and H J Stirton.

Appreciative reference was made to the services of Mr. Whittle Herbert, who, in reply, said he had been a member of the society for nineteen years, he joined the committee seventeen years ago, and was elected honorary secretary fourteen years ago.

POWER TO REFUSE EXHIBITS.

Mr. C. Holliday moved the adoption of a new rule which would enable the committee to refuse any entry made and not give any reasons for so doing. The rule was intended to be used against persons who had acted dishonourably.

Mr. Hathorn seconded the proposition.

The motion met with some opposition, several members feeling that an exhibitor whose entries were refused should have the right of having the reasons therefor.

The motion was carried.

Mr. Fell brought forward a resolution to secure the representation of the society at the Farmers' Conference.

Mr. T. Hyslop was one of the warmest supporters of the proposition, saying that the society would lose heavily if they did not associate themselves with the Conference.

The resolution was carried.

Messrs. Cratt and Fell were elected the delegates to the Conference.

The usual votes of thanks closed the meeting.

Malton Farmers' Association.

THE PRESIDENT'S ADDRESS.

AT the seventh annual meeting of the Malton Farmers' Association the President (Mr. William Baynes, M.L.A.) said:—During the past year five general meetings have been held, and delegates from the Association have taken part, as usual, in the deliberations of the Natal Farmers' Conference. The influence of that body, and its potential usefulness continue to be well maintained. Moreover, it is now recognised as a suitable preparation and stepping stone to a Parliamentary career. At the general meeting held on the 20th January, the Government's offer *re* the erection of a cattle dipping tank was considered and accepted, and a committee appointed to carry out the work. Our thanks are due to them for the efficient manner in which they have completed the job, and especially to Mr. R. Comins for his generous and public spirited contribution and assistance generally, in securing for this district a tank second, I believe, to none in South Africa. Most of us have already used it, and can testify to the wonderfully satisfactory results. I believe I am not far wrong in asserting that it has practically doubled the value of all the grazing land in the vicinity. The past year has been chiefly remarkable for the unprecedented drought that has pervaded the whole of South Africa. Neither history nor tradition makes mention of such a general failure of crops. Without railways and steamships there can be no doubt that great numbers of natives, having now no cattle to fall back on, must have died of famine. The Association, considering that the fertilizers applied to last year's crops are still unexhausted owing to the drought, decided not to take any action in purchasing manure this season. In view of the cost of freight I would strongly urge in future that only the highest and most concentrated class of fertilizers be ordered. It is gratifying to observe that many of our members are keenly alive to the advantage of adopting

new and improved implements and machinery. It is indeed poor economy to spend time in tinkering with the old and the obsolete. Who will be the first man to test the rotary disc plough on the soils of this neighbourhood? They are reported to have worked satisfactorily on the light and level lands where they have been publicly exhibited. There are few farms in this Colony where a windmill would not be found to be a useful adjunct of the homestead. In the United States and in Canada nearly every farmer has one for pumping, chaff cutting, grinding, etc., made in the small, compact form we now see, in which the whole circle of the wheel is filled up with vanes, thus giving as much power as the huge old-fashioned four-armed "sails." I understand that more power can be obtained by a sort of double wheeled windmill, in which one wheel is behind the other, and revolves in the opposite direction, and thus it is claimed that two 4 h.p. wheels may together yield 10 horse-power. Strenuous and persistent efforts continue to be made by the Government to prevent the Rhodesian cattle plague from invading our borders. It is to be hoped those efforts will suffer no relaxation, for, hitherto, that fell disease appears to have baffled the skill of Professor Koch and the other experts that have for some time been engaged in its investigation. I had rather not, at this stage, express an opinion upon the results of the Bloemfontein Conference. The terms, as affecting this Colony, were possibly the best that our representative could obtain, but they do not appear to be conspicuously favourable to the Natal farmer. When normal seasons revisit us more attention will probably be paid to tree planting and fruit culture. I would recommend those who are inclined that way to make the acquaintance of Mr. Sim, the genial Conservator of Forests, and also to study his articles now appearing in the *Agricultural Journal*. Mr. Maurice Evans's offer

of a money prize of £50 to each of the electoral Divisions of the Colony for plantations of trees, planted in the years 1904 and 1905, should surely induce one or more members of this Association to compete. Particulars of Mr. Evans's generous offer may be obtained from our hon. secretary. As this is a matter which especially concerns posterity, the young people should be encouraged and required to take an active participation in it. To plant a tree has ever been looked upon as a meritorious deed; to protect it in after years from grass fires, and other foes, denotes qualities akin to heroism. The spectacle of a fire-swept plantation is almost as saddening as a battle-field. A report of the first year's working of the Central Experiment Farm may now be expected and is commended to your careful perusal. I have twice visited the farm, and trust not one of you will fail to do so, as often as possible. For as new works and experiments are taken in hand and progress, so the interest deepens. A Bill "to aid and encourage the Agricultural Development of Natal," has passed the second reading in the Legislative Assembly, and is well worthy your serious consideration. It proposes to vest in a Land Board, subject to Government control, the power first to purchase lands suitable for closer European settlement on residential conditions, and second, to administer and deal with such lands, as well as the present Crown Lands of the Colony, by sale, lease, or otherwise. The main object of the Bill is, of course, to induce a larger population of European descent to settle on the land. No scheme, however, of State-aided immigration is contemplated. It is becoming more and more apparent that if the young people of this Colony are not to drift into the towns, or over the border, land must be provided on which there is a reasonable certainty that they will be able to earn, at any rate, a livelihood. Our experience of several seasons has proved conclusively that without means of irrigation there is, and can be, no such certainty. Now the Bill before the House contemplates the construction by the State of very comprehensive irrigation works in connection with the lands which it is sought to

acquire—works such as would be quite beyond the scope of private enterprise. At the same time we must not forget that, as a result of the policy indicated in this Bill a great stimulus will be given to the production of all kinds of food stuff, with possibly a considerable fall in prices. For I do not reckon that the Johannesburg market can be much longer relied upon. So much attention is being paid to the agricultural development of the neighbouring Colonies that unless we bestir ourselves we may even find them competing with our farmers for the supply of our own little local markets. In any case we may look for a reduction in the cost of living; and we should be very narrow-minded, indeed, if we regarded that as a calamity. With cheaper food an impetus would be given to industries and manufactures of many kinds, and artisans and mechanics would be happier and more reasonable men. Although this Bill is necessarily more or less of a tentative and experimental character, its aims are high, and there can be no doubt, I think, that its effect will be far-reaching and revolutionise in many ways the conditions of life in this Colony. To be convinced of the success of close settlements on irrigable areas of land, you should visit what were formerly the arid lands of Southern California. There we find hundreds of thousands of acres supplied with water from the far-distant mountains by canals, many miles in length. These lands are divided into small holdings—about 10 acres, I was told, being as much as one family could manage—for there is no coloured native labour there. These lots seem to be principally laid out as orange groves, orchards, vineyards, gardens, lawns and shrubberies. On most lots lovely villas and homesteads had been erected in various attractive styles of architecture, and through the whole settlements shady avenues laid off at regular intervals. Social, religious, and educational requirements were provided for by suitable public buildings, schools and churches. This transformation of a ghastly wilderness into a smiling arcadia has been effected by level-headed men of the world, whose enterprise and capital has enabled large communities of indus-

trious people to make a genteel livelihood and supply markets, thousands of miles away, with the wholesome and delicious fruits of the earth. Gentlemen, the rivers and streams of this Garden Colony fairly cry aloud to be conducted over the length and breadth of a thirsty land. Can we

blame them for gradually drying up, if we, and our Government, for ever turn a deaf ear to their appeal?

Mr. W. Baynes was re-elected President, E. S. Goodwill vice-President, and E. J. Smith hon. secretary and treasurer.

Farm Power.

THE "American Agriculturist" recently offered prizes for the best statement of experience in use of gasoline engines on the farm; the following are the two prize essays:—

G. W. LAZIER, Illinois.—I will endeavour to give your readers something of my experience with a gasoline engine on a farm of 320 acres. After over two years of constant use, I am convinced that when farmers in general fully appreciate the practicability of the gasoline engine, it will be considered as indispensable as any of the machines in common use to-day; as well to the small farmer as to the large stock raiser, the difference being only in the size of motor required.

My engine of four horse power is located in a building 16 x 20 immediately adjoining the barn on the north-east corner. I had no difficulty with the insurance companies, their only requirement being that the gasoline storage tank be outside the building, which is the customary manner of installing. As I use an electric motor, there is no fire in the building.

The engine has a drive pulley on either side, one of which drives a heavy shaft inside of the barn 26 feet long; the other a smaller one in the engine house, from which a pump and cream separator are operated. The pump-jack is connected with a short length on the end of this shaft coupled with a clutch (from an old binder), and can thus be thrown out of gear when desired. By this arrangement work can be done in the barn and engine house at the same time. The large shaft also projects out of the end

of the barn, so that we can run a corn sheller, saw and other machinery outside. Everything except the grinder is speeded to the pump. As pumping must be done every day, it can be done in connection with other work, thus effecting quite a saving in gasoline. I always pump while separating, and it is generally sufficient for the day. Inside the barn we run a grain elevator, by means of which one man can do the work of three at threshing time; a small grinder which grinds 15 to 20 bushels per hour; also a fanning mill, with which one man can clean seed or grain better than two could do by hand. The whole length of this shaft can be utilized as desired.

In the engine house we run the pump, separator, churn, grindstone, emery wheel and washing machine, which lightens the ever-dreaded washday—the washing being done entirely without hand rubbing. Do not overlook this. If you doubt whether the women folks appreciate this just tell them some Monday morning that you are out of gasoline. These last four machines are run direct from engine pulley, simply setting them in line. I have found the emery wheel of great service for keeping plows, cultivator wheels, etc., sharp and bright. The pump is an ordinary three-way force, fitted with 4½-inch cylinder, and is operated by means of an overhead jack (made from an old binder gear). Water is forced through underground pipes to two 10-foot tanks, each accessible from three yards. The engine renders a stand-pipe unnecessary, as water can always be pumped as needed fresh from

the well, without waiting for wind, which in this locality generally fails during harvest and threshing season, when water is most needed and time is precious.

The idea is quite prevalent that it requires an expert to keep a gasoline engine in running order. This is a mistake. Since mine was set up and started in March, 1900, I have never had an expert or mechanic touch it, and have never failed to make it do my work. I had had no experience with engines whatever. Any man who can run a self-binder successfully need have no fear of a gasoline engine. It is no more complicated. Just study out the principle upon which it works, so that if it is not working properly you can locate the trouble. Oil carefully, keep burrs tight and packing and battery in good condition, and you will have no serious difficulty. Too much cylinder oil and too much gasoline are common errors. My wife starts and runs my engine frequently.

As to cost of running, this depends entirely upon the amount and character of the work done. I think the manufacturers' estimate of one gallon per horse power for ten hours is approximately correct when applied to an engine in good condition and developing maximum power. I find, however, that it requires considerably more to do light work with a large engine than with a small one. Much gasoline may be wasted through leaky packing and improper adjustment of air valves. Use as little gasoline and as much air as possible to do your work. My gasoline bill has been a trifle over \$10 per year (bought at wholesale as all engine owners may buy). I have also spent \$4 during two years for oil and battery supplies. A large washing can be done for 5 cents at most, filling the water tanks meanwhile. Is it not a nickel well invested?

But someone will say, "Your outfit has cost a great deal of money." Not so very much. The churn, grindstone, farming mill and washing machine are the same we had when engine was purchased, only pulleys being added where needed. The elevator

cost about \$30 for lumber, chain and cups, the shafting and boxes being taken from old machinery, and I did all the work myself. The emery wheel is mounted on an old shaft and cost \$1.50. The grinder cost \$15, and cream separator \$65, belting about \$15.

The above outlines the uses to which I have applied my power, but I have by no means exhausted possibilities. There are two more applications which I have under consideration, both of which have been pronounced perfectly practical by experts to whom I have submitted my plans. One is an arrangement by which the hay tackle can be operated by power; a drum to wind up rope and controlled by a friction clutch being used; the other is an electric lighting system, consisting of a storage battery charged by a small dynamo run while doing other necessary work, and therefore adding nothing to running expenses. The gasoline engine will do much of the necessary work of the farm, lighten your burdens and those of the good wife as well; increase your income, save your time, and also furnish you with many of the conveniences and luxuries of the City, all of which tends toward placing farm life upon its proper basis and makes it more attractive and interesting for our boys and girls.

Jer. W. Kleppinger, Pennsylvania:— I have used a gasoline engine since March, 1901. The company from which I bought the engine having no agent here, I depended on myself and son to set it up, and though without experience with engines, we had the good luck to get it all in shape, to suit my barn. We connected the battery with the engine, and started, but it did not run fast enough for my thresher, so we used the belt on flywheel, and then we could thresh. Next we hitched it to the fodder crusher with success. Then we loaded the engine on a stone sled, and dragged it to wood place, and sawed a lot of wood. After the harvest we did some threshing at home, and worked on another small farm besides my own. We moved engine and thresher to that

place, threshed all the grain there, then moved to three other neighbouring farms, threshed all their grain and sawed some wood. Last winter we hauled the engines to six different places to saw wood and cut corn fodder. My engine is a four-horse power, an upright, and only a small machine. It is a little weak to run my thresher and separator, but my patrons are satisfied with its work.

All the repairs it needed we did ourselves, though nothing but farmers. The gasoline used for a day's work of 10 hours is about four gallons. If the power is not all needed it takes less gasoline. I would not like to part with my engine, for I can get more power out of it than I could get with a two-horse treading power. It is both handy and safe.

How Indiarubber is Manufactured.

THE first notice on record of the indiarubber tree—which when pricked or tapped exudes that glutinous substance which now occupies in a manufactured state a prominent place in the manufactures of the world—is given by Herrera, who in the second voyage of Columbus observed that the inhabitants of Hayti played a game with balls made “of the gum of a tree,” and the balls, although large, were lighter and bounced better than the windballs of Castile. Another famous Spanish geographer, Torquemada, in his “*De la Monarquía Indiana*,” published at Madrid in 1615, says:—“There is a tree which the (Mexican) Indians call *Ulequahuitl*, which is held in great estimation, and grows in the hot country. It is not a very high tree; the leaves are round and of an ashy colour. This tree yields a white and milky substance, thick and gummy, in great abundance.” He further states that the juice was collected and allowed to settle in calabashes, and was afterwards softened in hot water, or the juice smeared over the bodies of the aborigines and rubbed off when sufficiently dry. Even at this early stage the Spaniards used the juice of the “ule” tree to “waterproof their cloaks,” and possibly to preserve their Toledo blades from the ravages of rust until the next foe came round. This fact, however, apparently did not attract attention in the Old World, and no rubber seems to have reached Europe until long afterwards. The first accurate information concerning any of the caoutchouc (rubber) trees was

furnished by La Condamine, who was sent in 1735 by the French Government to measure an arc of the meridian near Quito; whilst some twenty years later other foreign scientists referred to the caoutchouc vegetation as growing profusely in French Guiana. Nevertheless indiarubber remained for some time unknown in England, except as a curiosity, for Dr. Priestley, in the preface to his work in perspective, called public attention to it as a novelty for erasing pencil marks, and stated that it was sold in cubical pieces of $\frac{1}{2}$ in. for 3s. each.

So much for the history of indiarubber in its crude state, but it is with the manufactured article, as occupying a prominent and valuable position in the commercial world, that we have to deal more particularly. Although the manufacture of rubber is largely carried on in Great Britain, Europe, and America, it was not until within the last decade or so that it was established on a considerable scale in Australia, but appearances indicate that the manufacture of rubber goods in the Antipodes is a sound business, and an important addition to the manufacturing industries of the Commonwealth.

Although several factories are now in operation in Melbourne, there is but one company that has made the necessary progress to be accepted as an object lesson in this particular trade. Needless to say, it is the Dunlop Pneumatic Tyre Company of Australia, Limited, that takes the pride of place, and one day last week an opportunity was offered by invi-

tation of inspecting the company's new factory and works, situated at Montague-road, South Melbourne, which brought together a large assemblage of representative citizens and visitors. The premises, built of blue stone, are somewhat extensive, covering an area of 60,000 square feet. All the machinery, with the exception of the drying-room, is located on the ground floor, and was erected at a cost of £25,000. The row of machines which meet the view, manipulate the raw rubber from the state in which it is received from the jungle forests into the finest manufactured articles. The first matter attended to is the removal of various impurities present in the crude material. The big lumps or masses, resembling a huge watermelon, are subjected to a hot-water soak, and thence are dumped, one piece at a time, into a large roller-mill, in which they are squeezed into a plastic mass. This goes through a long course of milling treatment and grinding, during which various colours can be given to the goods by adding such pigments as vermilion, oxide of chromium, etc. One of the most interesting machines noticeable in the factory is, undoubtedly, the calendering mill, which with its three hot metal cylinders maintains a continuous process of "finding and kneading." Then there are the two "vulcanising" ovens used for incorporating the rubber material with sulphur and other solid bodies as desired, from the fact that indiarubber goods would have very limited utility were they not so treated. After having been "vulcan-

ised" rubber can no longer be softened by an extraordinary fire heat, nor is it rendered rigidly cold, whilst it cannot be dissolved by an ordinary solvent. Of course the various kinds of rubber goods turned out by the Dunlop factory require to undergo different kinds of treatment and finish. For instance, a 50ft. length of I.R. hose is not handled the same as the Dunlop-Kelly solid rubber vehicle tyres, the one comprising a flexible piping, whilst the other is made of solid rubber condensed by a pressure of 1,000lb. to the square inch. But the "piece de resistance" is the famous Dunlop rubber tyre, which could be traced in the course of manufacture all through the establishment. The same applies to motor car tyres, which show signs of becoming progressive trade. It would require, however, nothing short of a recapitulation of the company's well-printed catalogue to show the extent and magnitude of the goods they turn out for daily commercial use.

Many high encomiums were expressed by the visitors regarding the completeness and commercial success of the Dunlop rubber works, which could not have failed to impress the sightseers as an object lesson of the highest degree. The Hon. Nicholas Fitzgerald presided at a repast subsequently held. During the course of the speeches it was mentioned that the company was inaugurated less than ten years ago, with half-a-dozen hands, now it gives employment to 150 factory hands, irrespective of the clerical and commercial staff.—"Queenslander."

Feeding and Firm Bacon.

SOME experiments made at the Guelph Agricultural Experiment Station, Canada, to determine the influence of food and exercise on the firmness of bacon, led to the following conclusions:—Exclusive maize-feeding for a somewhat extended period produced bacon of an extremely soft and undesirable character. No evil effects were noted from its use when fed in finishing pigs that had had

plenty of exercise until they had reached about 100 lb. live weight or had been fed skim-milk with a mixed grain ration until they had reached 100 lb. live weight. Pigs confined in pens and fed wheat-middlings during the early stages of growth, and finished off on peas, barley, and shorts, had a marked tendency toward softness. When these same foods were given, but the pigs allowed to have

plenty of exercise, much firmer bacon was produced. The evil effects of lack of exercise were largely overcome by the use of skim-milk and whey. From 2 lbs. to 2½ lbs. of whey is recommended for each pound of grain fed.

Barley alone has given good gains and exceptionally fine bacon. Peameal alone resulted in unthrifty animals and poor gains; but when mixed with middlings in the proportion of three parts peameal to one part middlings, good gains and an excellent quality of bacon were produced. It is recommended that peas always be fed in combination with other grains for pigs. "A two-thirds ration of barley, with all the rape the pigs would eat, followed by about three weeks' exclusive barley-feeding at the close, gave economical gains on the whole, and produced bacon of good quality, though scarcely so firm as that produced by barley or by

peas and middlings. Barley appears to be an exceptionally safe and valuable food for swine, whether fed alone or in combination with other feeds." The College experiments have also brought out the fact that "unthrifty pigs are more likely to produce soft bacon than growthy, well-fed pigs." The feeding of roots with the grain rations has not injuriously affected the quality of bacon produced. When equal weights of roots and meal were fed together the pigs made more rapid and economical gains than when meal alone was fed, and the bacon produced was superior in quality. This and many earlier experiments at the College show that succulent foods, whether roots or green feeds, tend to keep animals thrifty, and therefore produce firm bacon. The amount to use is about equal weights of succulent food and grain.

Preserving Eggs in Waterglass Solution.

A WRITER in the *Mark Lane Express* thus summarises his five years' successful use of waterglass for the preservation of eggs:—"I believe I was one of the first who took to it, and I have induced many to do so, and hope my remarks may help many of your readers in giving them confidence in the system, as well as detailing the process plainly. It is all easy, very easy, and in no way mysterious or very expensive. Waterglass is a liquid, almost as clear as water, and about the consistency of new-run honey. It has no smell, but is somewhat sticky, especially in a low temperature. Its chemical name is silicate of soda. When I first heard of it as an egg preservative, I asked several chemists in my nearest town for it, but not one had it; indeed, some of them had to consult their books to see what it was, and they said it was never asked for, and my first lot cost me over 1s. per lb., but 3lbs. or 4 lbs. can be secured for that amount now, and if taken in quantity may be bought for 2d. per lb. I state this that it may be understood I am not dealing with a high-priced article which all could not avail themselves of. Four articles are wanted—a

dish or dishes, waterglass, water, and eggs. The dish or vessel may be of any size, to hold from a score to 500 eggs. It may be of wood, stone, iron, zinc, or earthenware. I generally use various-sized casks cut in two, such as are often employed to feed cattle out of. They are cheap and convenient. Scald the dish clean, fill half full of boiling water, and as soon as the hand can be held in it add the waterglass. Measure the water as it is put in, and to 12 parts of water give 1 of waterglass. If you use 12 pints of water, employ 1 pint of waterglass; if 12 quarts, 1 quart; if 12 gallons, 1 gallon, and in a like proportion either up or down. Stir the liquid well as soon as the waterglass is put in. It mixes readily, and no one could tell it was there. The dish may be kept in the dairy, pantry, cellar, or cool room. The eggs may be put in every evening as collected until the vessel is full. All must be under cover or immersed. If the eggs are kept a few days before putting in they will still turn out all right, but they must be sound and sweet before they are placed in the liquid."

Durban Margarine Case.

MR. JAMES STUART, on the 1st inst., gave judgment in the case of Inspector of Nuisances *v.* J. J. Dunne, which has created much local interest.

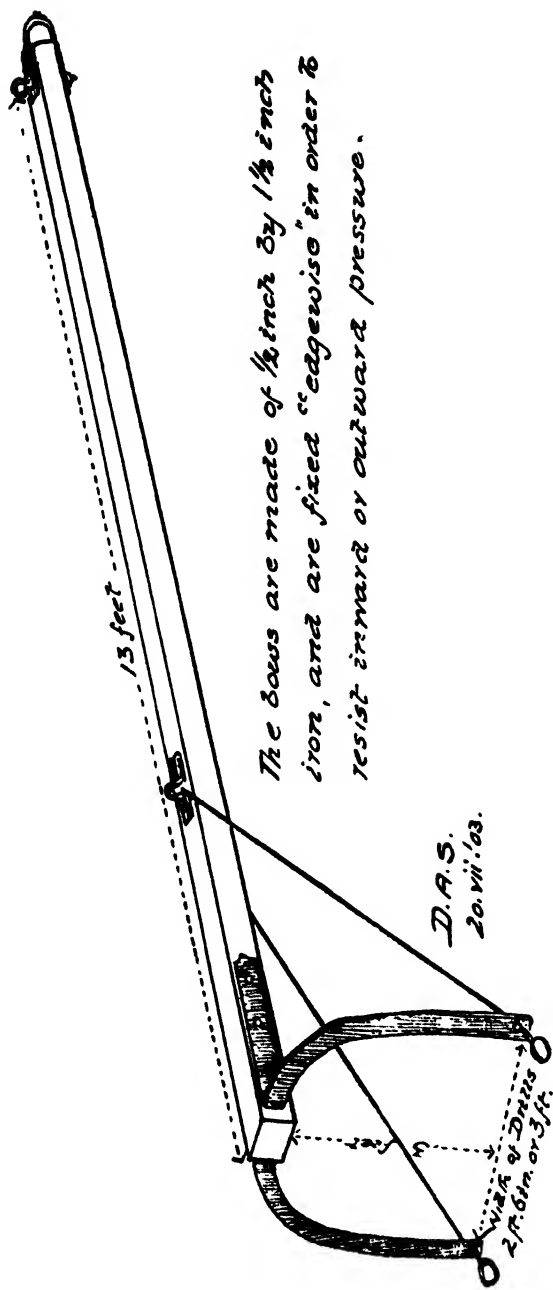
Mr. Stuart said: The defendant is charged with not conforming to law, inasmuch as he had in his store a certain vessel, containing margarine, that was not conspicuously marked "margarine" on the top, bottom and sides. As regards this, I find the vessel was conspicuously marked "margarine" on the bottom and sides, and had a lid that was similarly marked when the Inspectors went in to purchase; but at that time it was off, and therefore the vessel was not marked as it should have been. It failed as regards the top, but it was rightly marked on the sides and bottom. There is nothing to show the lid was on when Charlson entered, or when, later, Dawson came in. The law is clear, and I cannot set it aside. At the same time it should be construed in a reasonable manner. If margarine is asked for the lid must be taken off in order to get at it, and it would be absurd to say the law had been infringed because the lid or label is removed for the purpose of serving a customer. What, therefore, I think is required is that even vessels in actual use should always stand marked on top,

bottom, and sides, and be conspicuously marked up to the time of order, when the shop-keeper, having given the customer a full opportunity of viewing the vessel, may proceed to execute the order by temporarily removing the thing, whatever it may be, which bears the necessary information. And as soon as any order has been executed, the vessel should forthwith assume the normal state required by law. After hearing the evidence, I am satisfied that the vessel when the Inspectors came in was not conspicuously marked on the top. Defendant is, therefore, guilty of the charge. There is a second count: That defendant failed to deliver to the purchaser margarine in a proper wrapper on which was conspicuously printed "margarine" in capital letters. I consider there is no case here. The intention may have been to do up in an illegal wrapper, and had opportunity been given the law may have been contravened. As it is, I find it was not, inasmuch as the purchaser prevented the salesman from conforming to the law. I will not, under the circumstances, impose a penalty. He is cautioned and discharged. He is found not guilty as to the second count, and therefore, discharged.

Forage Experiments.

DR. HOWELL, the head of the chemical branch of the Department of Agriculture, N.S.W., in a pamphlet gives the result of a year's work with forage experiments in Southern Victoria. The crops grown included maize, amber-cane, kaffir corn, Egyptian corn, Japanese millet, pearl millet, planter's friend, teosinte, rape, kale, lucerne, cow peas, mangels, pumpkins, and sugar-beet. Dr. Howell's review of the results of all the field plots point to the following conclusions:—That certain of the sorghums, notably amber-cane and planter's friend, give promise of proving valuable addi-

tions to the summer crops of the south. The two millets tried, notably the Japanese, have nearly throughout proved a marked success. The great earliness, quick second growth, and heavy yields of the Japanese variety especially mark the crop out as one which will probably prove of great value. That the very large yields of rape indicate that Southern Victoria is remarkably well suited for its culture. Of all the crops tried, it showed the most marked response to liberal fertilisation. That the beet as a fodder crop has shown the same wide range of adaptability to the soils of the south as the rape.



A CULTIVATOR COUPLER.

(See Article.)

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Disc Plough Trials at Estcourt.

ON the 28th inst., writes the Estcourt correspondent of the *Mercury*, a ploughing match was held on Messrs. Cooke & Co.'s erf, next the old Pagoda. Mr. Kennedy represented Messrs. G. North & Son, of Durban, and had two Cockshutt-Rotary disc ploughs and the Columbia two-furrow mould board plough. Mr. Purser, representing Mr. Sully, of Durban, had the Rotary Dutchman disc plough and a two-furrow plough. The spot chosen was quite unsuitable for a proper trial of the merits of the respective ploughs, as only about two-thirds of the erf was available, and that space was rendered inconvenient by the ground fenced in within the erf. In the old days the erf was used as a road, the post-cart travelling over it, so that when the ploughs had passed over it, at the depth of 9 in. it revealed ground as hard as a brick. After the ploughing, it was put to the vote of those present—there was a good number of farmers present—and the vote was in favour of Sully's Rotary Dutchman for the disc plough, and North & Son's two-furrow mould board plough. There was a heated discussion between the representatives of the rival firms. Most of the farmers were of opinion that the space ploughed did not give space enough, as can be verified by viewing the zig-zag serpentine furrows made, and thought it was not a fair trial. It was resolved, with Mr. Rudolph's permission, to have another trial at Zaai Lager, across the Bushman's River, at 3 p.m. This was agreed to. Messrs. Mail, Trotter & Co., agents for Messrs. G. North & Son, provided refreshments.

There were not so many farmers at the second trial. The ploughmen had plenty of room. Some of the ground was stony, and the other wet from the rain. The furrows ploughed were not straight. The voting was the same as in the village. Two or three days previous, at a trial at

Mooi River, the voting of the farmers was in favour of North & Son's ploughs. I saw Mr. R. Douglass, of the Barns, and he says he has offered a piece of ground at his farm, giving half-a-mile stretch, for a trial, in a fortnight's time.

Gleanings.

In the hearing of the suit brought by Oswald M'Master, of Queensland, against John M'Philly, of Forbes, to recover £6,000 for alleged breach of contract regarding the sale of 10,000 sheep, plaintiff's case being that he contracted to buy young ewes, and defendant delivered old sheep, the jury returned a verdict for plaintiff for £3,731 10s.

The Farmer and Stockbreeder states that the result of experiments conducted in Wales, during the past year in the spraying of potatoes with Bordeaux mixture, shows that not only is disease checked, but the yield of potatoes is increased, by its use. In Ireland, the spraying of the potatoe crop is more extensively practised than in England and with, on the whole, good results.

Remarkably successful road-oiling experiments have been made in America. An aggregate of about 750 miles of country roads and city streets have been oiled for over a year, and, as a result, it is found that, not only does the oil successfully lay the dust, but it also binds together all loose particles, forming a tough surface, closely resembling asphalt. The amount of oil required for a 16 ft. roadway varied between 250 and 400 barrels of 42 gallons each to the mile.

According to the Journal of the Society of Arts, the fabrication of coco-nut butter is a matter of no small importance at Mannheim, in Germany. This factory appears to be the only large one in Germany; it produces about ten tons of butter per diem. The product is sold under the name of "Palmine," which is a trade mark, or under that of "Coco-nut Butter." It is extracted from the pulp of the coco-nut, and is used in the kitchen in the place of butter or lard. It is sold at 8s. per pound. There is a factory of the same product at Silvertown, near London, with a branch establishment at Liverpool. This product appears to be much sought after by vegetarians, by Jews and Mahometans, who prefer it to butter from the cow for either religious or moral reasons.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	J. Ralfe ...	Frere
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertso ...	Spitzburg
		"	F. R. Moor ...	Greystones
		"	J. G. Hatting ...	Rama
		"	A. C. Harding ...	Meadow Bank
		"	H. J. Hatting ...	Kopliegte
		"	C. J. Labuscagne ...	Haasfontein
J. Button ...	Estcourt, South of Bushman's River	"	Unknown ..	Meoi River Pound
		"	J. Haw ...	Woodleigh
		"	J. Lawrence ...	Grantleigh
		"	W. Fletcher ...	Erina
		"	H. Albrecht ...	Brynella
		"	J. Marais, jun. ...	Northcote
		"	J. J. Marais ...	Malan Spruit
		"	C. P. Marais ...	"
J. J. Hodson ...	Lion's River ...	"	W. Henderson ...	Hilton
		"	M. A. Sutton ...	Shaw's Flat
		"	Jos. Raw ..	Buffel's Bosch
		"	D. C. McKenzie... ..	Lion's Bush
		"	R. J. Spiers ...	Owthorn
E. J. B. Hosking ...	Upper Umkomanzi	"	J. W. T. Marwick ...	Mona Glen
		"	W. P. Gibson ...	Howard's Hill
		"	A. H. & R. H. Cockburn ...	Durslade
		"	Seyaga ..	"
K. Soutar ...	Portion of Lion's River	"	K. Soutar ...	Stey Braes
		"	A. Clouston ...	Nottingham Town Lands
J. Swales ...	Manda and Indwe-dwe	"	Pumputa & Charlie	Indwedwe
W. Wilson ...	Polela ...	"	J. Comrie ...	Hepburn
R. Vause ...	Ixopo ...	"	W. H. Walton ...	Greenvale
J. Trenor ...	Alfred ...	Lungsickness	W. Gold ...	Rockvale
W. Gray ...	Upper Tugela, South of Tugela River, and Estcourt, North of Bushman's River ...	Scab	Umpapu	Location
		"	N. J. Vandermerwe	Gourton
		"	W. P. Gray ...	The Heff
A. H. Ball ...	Weenen ...	Lungsickness	Seddon & Harris	Weenen Commonage
		"	J. W. Harris	New Settlement, Weenen
		Scab	C. R. Leroux ...	Waterfall
		"	L. J. Lotter ...	Waterfall
		"	J. P. Lotter ...	Berg Vleit
		"	J. J. Vermaak ...	Winterhoek
		"	G. J. Vanderwesthuyse	"
		"	C. J. van Rooyen	Annadale
		"	C. F. F. van Rooyen	Mona
		"	G. T. Van Rooyen	Pampoenek
E. Varty ...	Umvoti, Western Portion	"	W. H. Mayne ...	Mistley
G. N. Perfect ...	Umvoti, Eastern Portion	"		
C. J. van Rooyen...	Krantzkop ...	"	D. J. Martens ...	Jammerdal
		"	Nuss Bros. ...	Salem
R. J. Raw ...	Impendhile ...	"	Albert Meliffe ...	The Forks
		"	S. Faber ...	Virginia

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
R. J. Raw ...	Impendhle ...	Scab	E. Allborough ...	New Forncett
		"	Geshla ...	Impendhle Location
		"	Makekwana ...	
U. Swales ...	Umlazi ...	Lungsickness	H. Hill ...	Coquidale
		"	Cold Storage and Supply Co.	Richmond Farm, near Pinetown
		"	Native, Sam Fawkes	Assegai Kraal, near Botha's Hill
		"	John, & Mr. Kirk	Umlazi Location
		"	Miss Scott ...	Glenugi, New Germany
A. Hair ...	P.M. Burg City and Umgeni	Scab	E. Taylor and Umabana	Zwartkop Location
E. G. Clerk	Newcastle ...	Lungsickness	Dundu ...	Syl Krantz
A. J. Marshall	Dundee ...	Scab	Sai M'Lief ...	Banff
		"	N. Glutz ...	Swiss Valley
		"	H. Thorn ...	New Port
		"	Willie Africa ...	Waschbank
		"	N. B. Surtees ...	Gaitsford
		"	Elubi Gunena ...	"
		"	J. H. Hatting ...	Hattingsvale
		"	P. H. Marshall ...	Cleveland
		Lungsickness	Moety Metwa ...	Zietman's Drift
C. E. Walker	Umsinga ...	Scab	Elabelela ...	Location
		Lungsickness	Umtagati ...	Mhlezunga
		"	Mbitgi ...	Craigneathen
		"	J. S. Vanderwesthuysen ...	Pomeroy T. Lands
J. Chaplin ...	Klip River ...	"	Mahakana ...	Jobsdale
		"	Malandala ...	Matowan's Kop
		Scab	Gepo ...	Arcadia
		"	W. Wright ...	Colworth
		"	S. Schoeman ...	Maritz Drift
		"	P. Nicholson ...	Hobsland
		"	W. Leathern ...	Clydesdale
		"	Mahat-hi ...	Georgina
		"	H. W. Boers ...	Alexandra
		"	Mrs. M. K. du Plessis	Maggiesdale
		"	J. C. Buys ...	Reit Kuil
		"	P. K. Dalebont ...	Maggiesdale
		"	J. L. Marais ...	Meyer's Hook
		"	D. P. Conradi ...	"
J. M. Wales ...	Upper Tugela. N. of Tugela River	"	A. J. Marais ...	Waterfall
		"	W. O. Coventry ...	Goodoo
R. Wingfield Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	H. Boukes ...	Roodekop
G. Daniell ...	Vryheid ...	Lungsickness		
		Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata ...	"
		"	Umfumwa & Dehla	Waterval
		"	F. Combrink ...	Bankroet
		"	Kumandi ...	Hlobane
		"	T. Pretorius ...	Sterkspruit
		"	L. Botha ...	Waterval
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Soiyelana ...	Leuwnek
		"	Umkonyana ...	Welverdient
		"	G. van der Westhuizen ...	Vaalkopjes
C. T. Vaughan ...	Paulpietersburg ...	"	Stumpf ...	P.P. Burg T. Lands
		"	Natives ...	Jachtbaan
		Scab	— Heine ...	Bedrog
		"	E. Kloppe ...	Wachteenbeetjie Spruit

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and 2 flocks of sheep under license for Scab as under :—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni					
Districts	...	...	...	1 for Lungsickness	2 for Scab.
" Nkandhla and Ngutu Districts...	...	...	...	1	" — "
" North of White Umfolosi and Umfolosi Rivers	...	...	...	—	" — "
Total			...	2	2

Binderpest exists at undermentioned places :—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Lower Umfolosi, Nkandhla, Entonjaneni, and Ndwandwe Districts.

Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 2nd September, 1903.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of July, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903. July 1	Rose Trees	1 case (100)	New York	Gibraltar	Aphides present. fumigated.
" 2	Table Potatoes	448 cases	Las Palmas	Inkosi	Free of Pest.
" 6	Apples	1,860 "	Albany	Commonwealth	" "
" "	Table Potatoes	48 "	Mombassa	Nuddea	" "
" "	" " " " " " " "	620 bags	Albany	Commonwealth	" "
" 8	Fruit Trees " " " "	2 bales	Cape Town	Dunottar Castle	" "
" "	Ornamental Plants	1 case	Southampton	"	" "
" 10	Potatoes (Table)	{ 108 bags 1,110 cases }	Las Palmas	Umvoti	" "
" 13	" " " " " " " "	1,350 "	"	Inyati	" "
" "	" " " " " " " "	1,670 "	Melbourne	Gracchus	" "
" 14	Ornamental Plants, Bot.				
" "	Gardens	1 Warden case	Cape Town	Briton	" "
" "	Apples	754 cases	Albany	Salamis	" "
" "	Fruit Trees—				
" "	Savory	17 "	Melbourne	"	Fumigated.
" 15	W. Storm	11 bla. & 11 cases	"	"	"
" 16	W. Watson & Co.	1 bale	"	"	"
" 17	Cook & Sons	1 case	"	"	"
" "	F. Bell, Weedon & Co.	13 cases	"	"	"
" "	Savory	8 "	"	"	"
" "	Clark & Thielton	1 "	"	"	"
" 20	Table Potatoes	290 "	London	Umtata	Free of Pest.
" 25	" " " " " " " "	53 "	"	Carisbrk Castle	" "
" "	Fruit Trees, R. W. Ralfe	1 bale	Cape Town	"	" "
" "	Lilies, W. J. Bell	1 case	"	"	" "
" 29	Table Potatoes	700 cases	Las Palmas	Insiwza	" "
" 31	Fruit Trees and Vines, at Pickstone's... ..	14 bales	Cape Town	Kildonan Castle	" "

Custom House, Durban, 4th August, 1903.

C. B. JONES, Examining Officer.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.

No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.

No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.

No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.

No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.

No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.

No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.

No. 59a.—Scotsman, 21, with two years' local experience, seeks employment on farm. One year was spent on farm where general stock and agricultural farming operations were undertaken. Second year, chiefly devoted to poultry farming. Has thorough knowledge of the management of horses.

No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.

No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.

No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.

No. 66a.—Australian of Scottish parentage, 38 years of age and has been in close touch with farming in Australia. Has had large experience of wattle growing.

Pound Notices.

THE following stock, unless previously released, will be sold on the 7th October next:—

Estcourt.—Brown, dark heifer in calf; white on udder and under front legs no brands, age about two years. Black heifer, white face, also white mark on udder, about 18 months old, ear marks, two pieces out of one ear and one piece out of the other, branded right buttock L B.

Ingogo.—Black bull, with white belly, no brands. The above animal will be sold at the expiry of one month from this date (25th August) if not previously released.

Stripping cows in Denmark receives more attention there than it does with us at Home. A new plan has been introduced by a Danish veterinary surgeon, which is being adopted in Denmark and also on the Continent. Briefly stated, the new method follows the practice of calves when sucking. After the cow is milked, the bag is rubbed briskly with a coarse cloth to stimulate the flow of milk, while the quarters of the udder are further massaged with the finger and thumb so as to imitate the bobbing or pushing action of calves. By these means, "the milk cistern" is filled, and then drawn off by pulling the teats. Much skill is required in carrying it out, but time and trouble militate against its general adoption. In fact, some experienced Danish dairy farmers consider that "the stripping is done more thoroughly when the ordinary plan is followed, and richer stripplings obtained."

District Reports.

MAPUMULO, 29th August.—The winter has been an exceedingly mild and exceptionally dry one in this Division this year. Only 2 inches of rain fell for the three months of May, June and July, the heaviest fall during that period being .69 inch, registered on the 18th July. During August, however, we have been more fortunate, as, for three days' rain, we have had 1.61 inch, the heaviest fall for this month being .95 inch, on the 26th instant. Spring is now fast advancing, and the Native women and girls (who are still the chief tillers of the soil) are everywhere to be seen busy with their hoes. Indeed, I have already seen a few patches of mealies 3 or 4 inches high. The almost total loss of crops has been the cause of great scarcity of food amongst the Natives, who have, in consequence, turned out to work in large numbers. There are very few able-bodied men at present remaining at their kraals, and it is with the greatest difficulty that I have succeeded in finding men for Government road works. At no time, however, during the winter, has the scarcity of food amounted to a serious famine, as the local storekeepers have fairly well kept up the supply of mealies and beans, and a number of enterprising traders have sent mealies into various parts of this Location. The Government has also now deposited supplies of imported mealies for sale by the local storekeepers. It is a curious sidelight to the Native character, however, that although such supplies were sent by the Government at the request of the Natives themselves, yet, I am informed by the storekeepers that the Natives decline to purchase them, if they can get Natal grain, notwithstanding the fact that the latter is very considerably higher in price than the imported article, that the imported mealies appear to be sound, and of an excellent quality. The price of the imported Government mealies here is 27s. 6d. per muid, which the Native considers about 25s. too much. I am so told that although they are so unwilling to pay this price for the Government grain, they willingly pay 30s. per muid to passing traders for the same class of imported mealies. Locusts have been conspicuous by their absence until last week, when a large swarm was observed passing over the North-western boundary of the Division towards the Great Noodsberg. Stock is looking well for the time of the year. A few weeks ago several head of cattle died somewhat suddenly in a Native herd near Eisdumbeni, but fortunately quarantine was soon raised by the Stock Inspector, the cause of the deaths being apparently acute gallsickness, and no further deaths have occurred. A strong guard of Natives under a European officer is still being maintained on the Tugela banks in view of the continued presence of rinderpest in the Province of Zululand, and I think it is advisable that such quarantine guard should be continued for some time to come. I have had two cases of breach of quarantine regulations before me recently, cattle having been removed from Zulu-

land to this Division surreptitiously, and the offenders have been appropriately dealt with. During the months of March, April, and May a considerable number of horses succumbed to horsesickness, but at present this Division is quite free from stock disease of any kind. The health of the Native population is also good, an outbreak of bubonic plague having been fortunately stamped out after five weeks, with a loss of five Natives out of seven cases, the disease having been brought to this Division during the early part of the year by Native deserters from Durban. Owing to the loss of crops, and consequent absence of beer, there have been no faction fights in this Division this season. There have, however, been several cases of housebreaking, the branch store of Mrs. Goble, at Eisdumbeni, having been broken into no less than three times within three months. On the last occasion the burglar effected an entrance into the store by excavating a hole under the building, inside which he was caught and secured during the night.

J. J. JACKSON, Magistrate.

HOWICK, 1st September.—The weather has been pleasant throughout the month and the fruit trees are beginning to blossom. This morning, however, we experienced some heavy frost, which, no doubt, will have a detrimental effect on the fruit crop and the grass which was springing up after the rains we have had during the last fortnight. The total rainfall during that period was 1½ inches; maximum temperature 85 degrees, and the minimum temperature, 30 degrees. On the 29th August a strong north gale was blowing all day, but fortunately did not do much damage. The stock throughout the Division appears to be doing exceedingly well considering the very dry season we have had and the consequent scarcity of grass. Although food is at famine prices in certain parts of the Colony, the Natives of this Division seem to be able to procure enough foodstuffs from 21s. to 30s. per muid, and in most cases seem to have plenty of cash. This is moreover proved by the way fines etc. are paid.

J. W. CROSS, Magistrate.

IXOPO, 25th August.—During the last fortnight, the weather has been excessively dry and warm, and rain is urgently required. This Division has suffered a sad loss in the death of Mr. Thomas Foster, J.P., of Stainton. On many occasions he held the position of President to the Agricultural Society and Farmers' Association, with credit to himself and to the benefit of those Societies, and he was a member of the Licensing Board and Road Boards. Mr. Foster was one of the most progressive and successful farmers, and he did much to improve the stock by importing pure bred animals from England, and his kindly ways and genial manners will be missed by many, as he was beloved and respected by all who had the pleasure of knowing him.

FRANK E. FOXON, Magistrate.

DUNDEE, 27th August.—At length there is something to send you a line about from this frost-scorched, wind-driven, dusty browned district. Rain has fallen! It happened during the night of Wednesday, August 26th—a gentle, timid fall, so soft that one dreaded every minute it would cease, so shy was it of the all-absorbing attention and delight it occasioned—not continuous enough to soak the ill-tilled land for ploughing—but damp enough to moisten the black burnt grass roots, and change the dreary garb of nature, and to reach the surface roots of mulched fruit and rose trees, and set the pink and white blossoms of the thousand leafless peaches and apricots everywhere in flower. An exhibition of the famous disc plough took place at Glencoe on Wednesday, in the presence of a fairly large and representative gathering of farmers from various parts of the district. Short of reducing rock into mould, it appeared to give

general satisfaction, and to maintain the reputation claimed for it. The Division is practically clear of all stock diseases, and lambing and kidding are in full swing.

MAYNARD MATTHEWS, Magistrate.

NEW HANOVER, 18th August.—Since my last report, very little rain has fallen in this Division, with the exception of a few showers, and consequently the country looks very brown, though the pasture in most places is still sufficient for cattle. I am glad to say that stock of all kinds has been healthy throughout the country; no disease among cattle have been reported. The weather has been very cold and windy during the last few days. The Noodsberg Road Annual Show was held on the 6th inst., which was a great success, and was largely attended by the farmers.

A. RITTER, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—There is such a slight difference in the market, that one might be justified in saying that matters are practically at a standstill; prices are the same to-day as they were a month or six weeks back. Trade is extremely dull, and there seems very little to indicate a revival for some time to come. One matter that came as a blessing to all was the rain of last week, and it is a pleasure to report that sufficient fell in some parts of the Colony to enable some farmers to commence ploughing.

Mealies.—Very few Colonial Mealies can be obtained; the prices for these being between 18s. and 20s. per muid. A lot of Natal grain one morning realised 23s. American mealies now flood the market, and prices are quoted at 12s. duty paid, for South African, and 14s. for North American in Durban.

Buckwheat.—About 11s. 9d. per 100 lbs.

Hay.—Prices vary between 1s. 9d. to 3s. 9d. per 100 lbs.; bedding, from 4s. 6d. to 15s. per load.

Forage.—From 5s. 9d. to 10s. per 100 lbs.

Potatoes.—Fair samples are now offered at prices fluctuating between 7s. and 15s. 6d. per 100 lbs.; sweet potatoes from 4s. to 5s. 3d. per sack.

Pumpkins.—From 2s. 6d. to 11s. 6d. per dozen.

Beans.—About 21s. per 100 lbs.

Peas.—From 11s. 6d. per 100 lbs.

Green Barley.—This article is disposed of in large quantities almost every morning, the prices realised being from 2s. 6d. to 3s. per 100 lbs.

Mabele.—From 12s. 6d. per 100 lbs. to 15s. per 100 lbs. Imported considerably higher.

Onions.—From 13s. to 22s. 3d. per 100 lbs.

Butter.—Some very good butter is now sold daily, and prices have been almost everything between 1s. and 2s. 4d. per lb.

Eggs.—From 1s. 4d. to 2s. 2d. per dozen.

Poultry.—Common fowls, from 1s. 6d. to 4s. 3d. each; turkeys (cocks), 12s. to 16s. each; guinea

fowls, from 5s. to 7s. 9d. per brace; ducks, 5s. to 9s. 9d. per pair.

Sundries.—Mutton, 8d. to 9d. per lb.; pork, 4d. to 8d. per lb.; venison, 8d. per lb.; hares, 9d. to 1s. 3d. each; rabbits, 2s. each; trussed fowls, 3s. each; trussed turkeys, 10s. 3d. each; bacon, 5d. to 6½d. per lb.

Vegetables.—Beans, beetroot, celery, cabbages, carrots, cauliflowers, eschalots, onions, peas, radishes, tomatoes and turnips.

Fruit.—Bananas, lemons, oranges, mandarines, naartjes, papaws and pineapples.

Firewood.—From 7d. to 10d. per 100 lbs.; cut firewood from 10d. to 1s. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade continues dull and depressed, with small hope of any improvement in the near future.

Mealies.—The situation is governed entirely by importation. Colonial grain is seldom or never enquired for locally. White North Americans are quoted at about 11s. 6d. muid, although the cost is nearer 12s. 6d. in bond. South American white fetch 10s. 6d. muid, and are now experiencing a good demand owing to their excellent quality. American yellows bring 9s. 6d., but are not in request.

Potatoes are in fairly large supply at all prices. Best Colonial's still bring 17s. 6d. inferior 13s. 6d. Good Australians are worth 15s.

Forage—Best samples 10s. 6½d. per 100 lbs., with small enquiry.

Algerian Seed Oats.—Enquiry for spring planting is now commencing. Intending buyers would do well to beware of qualities offered, and to make sure that the seed is genuine Algerian, and not a variety merely similar in appearance.

JOHANNESBURG.—We regret to say that our special report for this issue has not reached us.

Stock Diseases Proclamations In force.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos. 38, of 1894; 1, of 1896; 34, of 1896; and 3, of 1897; or of any Act to be construed therewith, or of any Proclamation which may be issued thereunder.

PROCLAMATION No. 43, 1900.

Principal Veterinary Surgeon under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION No. 54, 1894.

Importation of dogs into Natal prohibited except under certain conditions.

PROCLAMATION No. 8, 1901.

Regulations under Lungsickness Act. Cattle allowed to leave an infected area upon written permission from Principal Veterinary Surgeon.

PROCLAMATION No. 59, 1901.

Cattle from Basutoland prohibited from entering Natal.

PROCLAMATION No. 29, 1901, and 52, 1902.

Zululand declared an infected area. No cattle allowed to leave or enter that Province.

PROCLAMATION No. 46, 1903.

Cattle allowed to enter Zululand upon permit from Principal Veterinary Surgeon.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district allowed to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 98, 1901.

Cattle from Transvaal prohibited from entering Natal.

GOVERNMENT NOTICE No. 506, 1901.

Any part or parts or any material prepared with or from animals affected with or having died from Rinderpest may not be introduced into Natal nor be removed from one place in Colony to another, except under written authority from Principal Veterinary Surgeon.

PROCLAMATION No. 36, 1902.

Importation of cattle prohibited from following countries:—The Colony of Rhodesia; the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana, in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36, 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston, inclusive.

PROCLAMATION No. 71, 1902.

Importation of cattle prohibited from all States of the Australian Commonwealth.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district permitted to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 15, 1903.

Cattle from East Coast of Africa prohibited from being imported into Natal.

PROCLAMATION No. 25, 1903.

Certain areas—Zululand and districts of Vryheid and Paulpietersburg declared infected areas on account of Rinderpest.

PROCLAMATION No. 63, 1903.

Importation into Natal of cattle, sheep, goats and pigs from Argentine prohibited.

PROCLAMATION No. 77, 1903.

Importation into Natal of horses, mules and cattle from Mauritius and India prohibited. Under certain conditions animals from India may be imported into Natal.

PROCLAMATION No. 79, 1903.

Portion of Ingwavuma district, Zululand, declared an infected area.

PROCLAMATION No. 82, 1903.

Sans Souci, Estecurt Division, and surrounding farms declared infected area.

Weekly Rinderpest Report up to 1st September, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths to date from the 26th May, 1903
<i>Zululand.</i>			
Eshowe District	10	15	207
Umlalazi District	14	23	104
Lower Umfolosi District	...	...	20
Nkandhla District	10	15	24
Mahlabatini District	5	8	56
Ndwandwe District	2	5	87
Hlabisa District	...	...	22
Entonjaneni District	...	...	1
<i>Vryheid District.</i>	10	16	82

1st September, 1903 **S. B. WOOLATT,**
P. V. SURGEON.

The Agricultural Journal

AND MINING RECORD.

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Quality in Tobacco.

(By CHAS. H. LEPPER.)

WHY should Natal tobacco be unpalatable to most smokers? Why should it be virtually unsaleable in competition with Transvaal tobaccos? Yet such is, unfortunately, the case, as Natal planters know only too well when they have attempted to find a market, say in Johannesburg, where there are at this moment many thousands of pounds of Natal tobacco stored, and which cannot be got rid of by the holders at any price, except by adulterating their Transvaal tobaccos with a small proportion of this Natal "rubbish."

Any suggestion which may point out a way to alter this unfortunate condition of affairs should be welcome. Natal possesses both soil and climate eminently suitable for the growth of tobacco—that much is admitted. With so much in its

favour, is there any reason why it should be impossible to produce good quality, as well as quantity? I may be wrong, but I have watched tobacco cultivation in many parts of the world, and I am disposed to believe that there is no reason why Natal should not produce excellent tobacco, if the necessary effort were made, and the necessary experiments scientifically conducted. These would be so expensive that it might be more than one should expect individuals to undertake, but in a country so favoured by Nature for tobacco cultivation, and in view of the revenue and prosperity attached to a successful tobacco industry, would it be too much to expect the Government to take up the subject seriously?

Let me attempt to show the grounds

for my belief that there is no sufficient reason why Natal should not be able to produce tobacco of the best quality.

Granted that the soil and climate are suitable, and granted that the cultivation and manufacture are well attended to, what causes differences in quality between two tobaccos grown in different countries, all other things being equal?

For many years past it has been well known to expert dairymen that the flavour of cheese is due to micro-organisms, and that different flavours are due to different micro-organisms. Thus, granted that we make a cheese according to the rules of making, say a Stilton, or a Roquefort, we shall fail in all probability to obtain the true flavour of these cheeses unless we can import into our cheese-room the particular micro-organism upon which their peculiar flavours depend. It used to be called "fungus" in the days when bacteriology was unheard of as a science. In all cases where organic matter is subjected to a partial degree of "fermentation," as in the case of cheese, tea manufacture, and tobacco manufacture, the flavour is due to, and is dependent upon, the action of micro-organisms, and the latter vary, and as they vary so does the flavour resulting from their actions.

This has been known for years, but as usual we have been slow in recognising the value of such a discovery, and turning it to a valuable account in the case of tobacco manufacture. The dairy industry, on the other hand, long since turned the discovery to excellent and profitable account. Is it not time that the tobacco industry awakened to the prospect thus opened out of permitting Natal to become one of the best tobacco producers in the world?

Dr. Suchsland years ago proved that the flavour of tobacco was due to the par-

ticular kind of micro-organism employed in "curing" the tobacco. Thus the flavour of Havana and Virginia tobaccos are due to two different micro-organisms, and further, if either of these is employed in the "curing" of tobacco grown in other countries, the flavour is that of Havana or of Virginia tobacco, according to the micro-organism employed. The micro-organisms are captured during the "fermenting" process of real Havana or Virginia leaves, and with special precautions are conveyed where desired.

According to his experiments, the best tobaccos can be spoiled in flavour by being treated to a dose of micro-organisms from tobacco of inferior flavour. Thus Cuban-grown leaf was spoiled by micro-organisms conveyed from German-grown tobacco. And — inversely — German-grown leaf was given the quality of Havana and Virginia tobaccos by means of micro-organisms brought from those places.

Dr. Suchsland is said to have patented his process, but I have yet to learn that any process can be protected by a valid patent. A process is not an appliance, and the best Patent Office lawyers warn their clients of the futility of attempting to protect "Processes." The example of the celebrated gold ore reduction case on the Rand is an illustration in point. Now, if quality is at command by merely importing and properly applying the desired flavour by applying the corresponding micro-organism, is not success merely a matter of experimenting?

In that case, have I not said sufficient to show the grounds for my belief, that there is no sufficient reason why Natal should not be able to produce tobacco of the best quality? More than that I did not set out to do.

Passing Notes.

DISC PLOUGHS.—Ergates, in his interview with Mr. Fritz Reiche, shows some astonishment that at a trial of disc ploughs in the neighbourhood of Noods-

berg Road the advantages of the new plough were not realised. He appears to think, from the information he got, that the conditions of the trial were not suit-

able. Here is a report from the *Mercury* of a trial in the neighbourhood of Richmond, which is also averse to the "glorified disc harrow." Says the correspondent of our contemporary :—"There was a congregation of nearly 60 farmers at Mr. John Marwick's on Friday, for the purpose of seeing trials of ploughs. The disc ploughs, of which so much was expected, apparently proved a failure, being unable to make any headway against the cloggy adhesive soil selected for trial by Mr. Marwick. The disc ploughs tried were the 'Cockshutt' and the 'Rotary Dutchman,' and, if anything, the latter was the better of the two. The redeeming feature of the trials was a two furrow 'Columbia' plough, stocked by George North & Son, Durban, which did its work splendidly, cutting the soil decisively and cleanly, and turning the sod well over." Despite these two unpropitious trials, the future of the disc plough, under suitable conditions, is certain. In the details and in the workmanship, many of these ploughs are extremely defective, but in the course of time it may confidently be expected that these important, yet merely minor defects, will disappear.

VETERINARY REPORTS.—In the Veterinary Reports published in this issue, fully the usual quantity of generally interesting matter will be found. Of course, what may be called the local news,

is of limited interest to all in the Colony, but the interest of the technical information with regard to certain stock complaints, etc., common to the Colony is special, and should be of much practical service. Mr. Verney gives a graphic description of what may be expected from using an unsuitable substitute for a probang. On the subject of vegetable poisoning Mr. Cordy makes some practical suggestions. Cows, apparently, have been experiencing greater difficulty than usual in getting rid of their after-births. Mr. Verney, Mr. Power, and Mr. Webb all write at considerable length on the subject. What Mr. Webb has written is practically an essay, and will be found well worthy of perusal. All this class of information should be stored up mentally by stock-owners, and if that should not be possible, it should be kept accessible for instant reference.

RINDERPEST INOCULATION POWERS.—For a long time regret has been periodically expressed in the veterinary reports as to the absence of legal power to compel the inoculation of in-contact cattle, or cattle suspected of being in-contact. In the August reports published to-day, further reference to the evils arising from the want of the necessary power are again given voice to. Happily, the power is now supplied; on the 15th inst. the long wanted Act was gazetted.

Veterinary Changes.

D. V.S. TYLER has been placed in charge of the Vryheid and Paulpietersburg Districts. Residence, Vryheid.

D.V.S. Fryth has assumed charge of Zululand. Residence, Eshowe

Mr. A. F. Harber, M.R.C.V.S., has been appointed D.V. Surgeon. His District comprises Maritzburg City, the Umgeni, and Upper Umkomanzi Divisions. Residence, Maritzburg.

Paspalum dilatatum.

ON application to the Director of Agriculture, quantities of 1lb. each of *Paspalum d.* seed may be obtained. Very much has already been published in the *Journal* with respect to the propagation of this grass. In the preliminary stage too much attention cannot be given if the

weather should prove unfavourable. The weather is the great factor in success for several weeks after the seed has been sown. In the interview of Ergates with Mr. F. Reiche some interesting information on this subject will be found.

Peruvian or Cusco Maize.

SAMPLES from a small quantity of this maize have recently been distributed among farmers. In Peru this class of mealie thrives prodigiously; height from 20 to 30 feet, two or three cobs to each stalk, and each cob 2 feet long and 3 or 4 inches in diameter. Where the seasons

are short, it is already proved beyond discussion that this maize cannot be acclimatised. Its three great requirements are:—Shelter, rich deep soil, and a long season. In this Colony of climatic and soil variety, the necessary conditions should not be difficult to find.

Rhodesian Redwater.

The following is the Bill "For preventing the spread of the disease known as Rhodesian Redwater" as it left the Legislative Council, having passed through all its stages.

BE IT ENACTED by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows:—

1. In this Act the expression "the Minister" means the Minister having charge of the Department of Agriculture. The expression "the disease" means the disease commonly known as Rhodesian Redwater, or East African Coast Fever.

2. The Minister shall have power to quarantine or destroy or dip any cattle which may be reported to him to be infected with the disease, or to have mixed or been in contact with infected cattle, or which there are reasonable grounds for believing to have been upon infected land (that is to say, land on which infected cattle have been kept or pastured, or over which they may have passed, or in any other way exposed to the risk of contracting the disease, or whenever he considers it necessary to do so in order to prevent the introduction or spread of the disease in the Colony.

3. The Minister shall have power to declare any area to be an affected area within the meaning of this Act, and to prohibit the ingress and egress of cattle or other animals into or from any such infected area.

The Principal Veterinary Surgeon or any District Veterinary Surgeon or Stock Inspector shall have power, pending the instructions of the Minister, to exercise the powers given by this section to the Minister. He shall instantly report any order so made to the Minister, who shall take such action thereon as he may think proper.

4. The Minister shall have power to define a zone of country along any border of the Colony, or around any infected area, or at any part of the Colony, where it may be considered necessary, and to order that all such cattle or other animals as he may direct shall be removed from any such zone; and that no such cattle or other animals shall be allowed to enter or to be in such zone.

5. The Principal Veterinary Surgeon shall have power, subject to the approval of the Minister, which shall be obtained as soon afterwards as conveniently may be, to quarantine any cattle or other animals when he considers it necessary to do so, and to order any cattle or other animals to be dipped or dressed in such way as he may direct for destroying ticks, before allowing them to be removed from a quarantine or an infected area.

6. It shall be lawful for the Minister to order that all cattle in the Colony or in any portion thereof, and such other animals as he shall determine, shall be dipped or dressed at such time or times, and in such manner as he may prescribe for the purpose of destroying ticks.

7. The Minister shall have power to order the removal of cattle or other animals from one portion to another of an infected area, and to enforce the isolation of cattle or other animals on any specified portion of an infected area: Provided that no cattle shall be removed to or across a farm occupied by clean cattle.

8. The Minister shall have power to prohibit the removal from an infected area into any other part of the Colony of hay or fodder, or of any other thing which he considers likely to convey ticks or cause infection.

9. The Minister shall have power to order that any cattle which may recover from the disease be branded in such

manner and with such marks as he may direct, and to forbid the removal of such cattle from an infected area, or from any specified place, into any other part of the Colony.

10. The Principal Veterinary Surgeon, or any District Veterinary Surgeon, may order the destruction of any animal which shall have been brought into this Colony in contravention of this Act or of Law No. 13, 1866, or Act No. 38, 1894, or which may stray or be removed from an infected area, and no person shall be entitled to compensation or payment in respect of any animal which may be so destroyed.

11. The Governor in Council may, by notice in the *Government Gazette*, order that any method of inoculation or treatment described in such notice shall be adopted for the prevention of the disease.

After the publication of such notice

(a). The Principal Veterinary Surgeon, or any District Veterinary Surgeon, may order any cattle to be inoculated or treated according to the method described in the notice, if he shall have reason to believe that they are infected with the disease or have been exposed to the risk of infection, or are likely to spread the disease.

(b). The Minister may, by notice in the *Government Gazette*, order that all cattle in any area or part of the Colony, shall be inoculated or treated according to the prescribed method.

The Regulations hereinafter provided for may prescribe the mode and conditions of effecting the inoculation or treatment, and in all matters necessary to be observed in connection therewith.

12. Any order of the Minister or Principal Veterinary Surgeon may be enforced by an officer of the Veterinary Department, or by any person whom the Minister may appoint for the purpose.

13. The owner of any cattle or of any animal, or the person in whose possession or charge the same may be, shall promptly obey and carry out any order given for the isolation, quarantine, dipping, dressing or the removal thereof, or any other lawful order made under this Act or the regulations. If he shall fail or neglect to

do so, the District Veterinary Surgeon, or other officer, may carry out the order at the cost of the owner or such other person as aforesaid, who shall not thereby be relieved of any liability to punishment as hereinafter provided; and such cost shall be recoverable in the Court of the Magistrate of the Division in which the order shall have been so carried out, or in the Supreme Court of the Colony.

14. Quarantine or isolation of cattle or other animals under this Act shall continue for such time as shall be prescribed by the Minister or Principal Veterinary Surgeon.

15. The Minister may construct tanks at public expense in any part of the Colony for dipping cattle or other animals, and may make such charges for dipping as he may see fit, and recover same from the owners of cattle or other animals dipped, or from the persons in charge of the same.

16. The Governor in Council may from time to time make regulations for carrying out the purposes of this Act. Such regulations may, amongst other things, prescribe the mode of quarantine or isolation of cattle or other animals and the means to be used in enforcing the same, and may define the authority and duties of guards and the like.

17. Any regulations made under this Act, and any order declaring an infected area, or defining a zone in terms of Section 4, or ordering compulsory dipping in terms of Section 6, shall be published in the *Government Gazette* as soon thereafter as possible.

18. If upon the examination of the organs of any animal destroyed under the provisions of Section 2 of this Act it shall be ascertained by the Principal Veterinary Surgeon, or any District Veterinary Surgeon, and certified by the Minister that such animal was not suffering from the disease, the owner shall be entitled to be paid from the public revenue the value of such animal immediately before death: Provided that the payment shall in no case exceed the rates set forth in the Schedule to this Act.

19. In the event of any person suffering any loss or damage in consequence of the creation of a zone in terms of Section 4 hereof, he shall be entitled to be paid from the public revenue the

amount thereof: Provided that in the event of any dispute arising between such person and the Government as to the amount of such loss or damage the same shall be referred to arbitration.

20. Any person who shall contravene this Act or any of the regulations, or who shall disobey any order made thereunder, or who shall neglect to carry out any duty imposed upon him by the Act or the regulations, shall be guilty of an offence, and shall be liable, upon conviction in the Court of a Magistrate, to a fine not exceeding One Hundred Pounds (£100), or to imprisonment, with or

without hard labour, and with or without the option of a fine, for any term not exceeding six months.

21. Nothing in this Act shall be deemed to repeal or lessen the effect of any other Law or Act relating to diseases of animals.

SCHEDULE.

	£	s.	d.
1. Calves under 12 months ...	5	0	0
2. Yearlings (oxen and heifers)	7	0	0
3. Two-year-olds (oxen and heifers) ...	9	0	0
4. Cows and heifers, 3-year-olds and upwards ...	11	0	0
5. Oxen and Bulls ...	14	0	0

How to fill Dongas.

THE Hon. J. Baynes, M.L.A., has been good enough to communicate to us a system by which, to a great extent, dongas may be filled up. The system is simple in the extreme; that of planting at intervals American aloes across the beds and banks of the dongas. Where it is decided to put one of these live riffles, a trench, to take the roots, is to be dug from side to side. In planting the aloes, lay them down horizontally, the leaves pointing down the donga and the roots upwards. In using the word "horizontal," we mean as horizontal as possible, for, of course, the strong out-growing leaves of the plant prevent a really prone position. The bigger plants should be placed at the bottom and the smaller may be planted up the sides. The planting must be as close as possible. The frequency of these aloe riffles depends on the character and fall of the donga;

the more precipitous the donga, the more frequent the riffles. After every storm a certain amount of soil will be left behind or covering each riffle. Here the life principle of aloes under such conditions asserts itself; new suckers, new little plants raise themselves on the covered mass below, and thus, in course of time, the donga becomes blocked and filled in. In those numerous parts of the Colony where the land is inconveniently scored by dongas and where but little alteration in the earth's surface—produced, for instance, by a goat track or a Natives' footpath—will lead to the creation of fresh dongas, the information should prove of great value. To those also who are engaged in constructing roads or railroads, the knowledge of how washes may be easily and cheaply stopped or controlled should also be welcome.

Central Experiment Farm.

MONTHLY REPORT.

THE DIRECTOR OF AGRICULTURE—

DURING the month of August the weather was pleasant, although at times the temperature was low, and on several occasions registered frost. On the 26th, 27th, and 28th an inch of rain fell, which gave the young grass a start on the recent burns, and with an occasional shower and warm weather, good pastura

may be expected soon. The oxen are in fair condition, considering the amount of work they have done all through the dry season. A very strong hurricane of wind was experienced on the 29th, and did some damage to buildings.

By the latter end of the month a good deal of ploughing was done, and a commencement was made on the season's ex-

periment work. At date of writing three sowings have been done with potatoes, oats, barley, wheat, rye, tares, beet, broad beans, kidney beans, soy beans, York and hero peas on the "Times of sowing section."

On "The modes of applying manure section," 29 plots of potatoes are planted; variety—Suttons Abundance.

On the variety section—

99	varieties of wheat-
36	„ peas
18	„ onions
15	„ lettuce
10	„ spinach

have also been planted. In order that the field experimenter and assistants may be able to keep their work up to date, more heavy draught well trained horses are wanted.

On the main crops, four acres of horse tooth mealies were planted on the 14th August, and at present have come up very regularly, and are showing from end to end in the drills.

Eight acres of potatoes have been put in at intervals, the first planting being on 21st August. Varieties:—Langworthy, Up-to-Date, Australian Brown's, and imported Early Rose.

Forty applicants have been supplied with samples of Medeah Red Egyptian, and Belotourka wheats, and as there is still a quantity on hand, samples are still to be had. As wheats were not in the "Times of sowing section" last season, I have been unable to reply to enquiries as to the best time of planting. I should say the present month is quite suitable, but planting in March and the harvest in October would probably be preferable.

The trial of McCormick's harvester and binder was very satisfactory, but the crop being so dry and brittle, the implement was not seen to advantage. It can be drawn by two horses; from 4 to 5 acres a day could be cut and bound. The cost of the implement is £45, landed in Durban.

ALEXANDER REID,

Farm Manager.

Garden Notes for September.

KITCHEN GARDEN.—Nearly all kinds of vegetable seeds may be sown this month, including Dwarf and Running Beans, Asparagus, Globe Artichoke, Beet, early varieties of Cabbage, Capsicum, Carrot, Cucumber, Egg Plant, Kohl Rabi, Leek, Lettuce, Sweet Melon, Water Melon, Mustard and Cress, Okra, Onion, Parsley-Radish, Pumpkin, Rhubarb, Salsafy, Spinach, Squash, Tomato, Tree Tomato, Vegetable and Custard Marrow.

As the sun is now gaining more power, it will be necessary in all cases, except Peas and Beans, to afford some sort of shade immediately seeds are sown. The best material for this purpose is straw, but if this is not to be had, grass or hay will do almost as well. This should not be removed until the seedlings are quite through, and then only in part until they are able to bear the sun, and all the watering must be done through the shading. The advantage of this plan can be demonstrated if any one wishes to try it, by shading one bed of seeds and leaving

another bed, sown at the same time, unshaded. The surface soil in the unshaded bed will, with the constant watering which will be necessary to keep it from drying up, become hard and caked on the surface, and the young seedlings will perish, being unable to push through. The seedlings on the shaded bed having a loose moist surface germinate freely, and come through without the slightest check, and are also less liable to damage from heavy rain storms, which frequently wash out those that are unprotected. It is often remarked that self-sown seeds always come up, but this is true only where the conditions are favourable. As a rule, self-sown seeds have the protection of the old stems and foliage of the parent plants, and are not drenched every day with water on an exposed surface like most hand-sown seeds, but remain dormant, and germinate when conditions are favourable. All growing crops should be hoed over frequently to keep down weeds and also to keep the surface open. A good mulch of half decayed manure

will be beneficial to young plants of Cabbage, Tomato, Marrow, Cucumber, etc. This conserves moisture, preventing evaporation, and hardening of surface soil.

Flower Garden.—All kinds of tender Annuals and Perennials may now be sown with safety, such as Balsam, Celosia, Christata, and Plumosa, Coboea Coleus, Cosmos, Dahlia, Helitrope, Ipomea, Impatiens Sultani, Lantana Marigold, Mina lobata, Nasturtium, Portulaca, and Zinnia, Marguerite Chrysanthemum; also continue to sow for succession the hardier flower seeds, such as Aster Candytuft, Gaillardia, Carnation, Phlox Drum-mindi, Dianthus, Coropsis, Larkspur, Petunia.

Margaret Carnation sown now will produce flowers in the autumn and early winter. Mina lobata or Ipomea Versicolor is one of the most beautiful annual Climbers in cultivation, being tender and very susceptible to frost, it should be grown in the most sheltered place that can be found. A verandah or wall with a north aspect will suit it. When grown in a favourable situation it will produce its masses of beautiful orange and yellow flowers in profusion in the autumn and winter months. Other beautiful varieties of Ipomoea should be sown at once; two especially are well worth growing, viz., Bona nox and Mexicana, with pure white flowers almost as large as a saucer. The first, as its name implies, is the night blooming Ipomea, and Mexicana, similar in other respects, flowers in the day time. Another variety, Blue Dawn, is also very pretty, and flowers on a sheltered wall late in the autumn.

All kinds of Perennials may now be taken up, divided, and replanted, and cuttings put in if required. Where Cannas are required, these should be planted once in rich well manured soil, and be freely supplied with water. As soon as they make a show of flowering, give liquid manure twice a week. Old flowering stems as they go out of bloom should be cut out near the ground, and not allowed to run to seed. While there is nothing so handsome and showy as some of the New Orchid flowering Cannas well cultivated, there is nothing so weedy-

looking if neglected and allowed to grow wild. The planting of all kinds of deciduous fruit trees, especially the stone fruits, should be completed without delay. Citrus, such as Orange, Naartje, Lemon, etc., may be planted later with advantage during November, December, and January.

Grape Vines.

NOTICE is drawn to Rule 1 of Proclamation No. 37, 1900, made under Section 2 of Law No. 15, 1881, which reads:—

“The Importation of all Grape Vines, cuttings, grafts, or foliage thereof, is prohibited unless imported by the Department of Agriculture.”

Consequent upon the open and surreptitious disregard of this Rule, and consequent upon the discovery of Phylloxera Vastatrix in Pietermaritzburg, it is hereby notified that this Rule will be strictly enforced.—Government Notice 629, 1903.

RHODESIAN REDWATER BILL.—In this issue we have the pleasure of presenting to our readers the Bill as it has passed both Houses of Parliament.

HELD OVER.—Owing to the pressure on our space correspondence, and some articles, are unavoidably held over.

The *Louisiana Planter* says:—The sugar world, at least the United States part of it, is slow to appreciate the great value of molasses for stock feeding. While it has been definitely and frequently stated in Louisiana that a pound of molasses has about as much value for stock feeding as a pound of oats or of corn, still our sugar planters will persist in selling their molasses and buying oats and corn from the western States.

Noodsberg Road.

INTERVIEW WITH MR. FRITZ REICHE.

By ERGATES.

NOODSBERG nomenclature is puzzling to an outsider. Noodsberg is one district, Noodsberg Road is another, and Noodsberg Road on the railway has nothing to do with either of the districts. Natal geography, as it has been made of late, is often poverty stricken and infelicitous, and, with respect to Noodsberg, Noodsberg Road, and Noodsberg Road Rail, the postal officials and others interested are deserving of commiseration.

Mr. Fritz Reiche lives not far from the centre of the Noodsberg Road district, and owing to the fact that besides being a farmer he is also a storekeeper, he is a competent authority on what is going on around him.

Mr. Reiche, then with his father, arrived on his farm in 1877. In 1883 storekeeping was added to farming. The homestead is close to the main from Maritzburg to Stanger. From Maritzburg by road the distance is eighteen miles; by rail to the station named in honour of the district, the distance is thirty-four miles. When arriving in 1877, the district was sparsely occupied, Mr. J. H. Holley, J.P., and Mr. Wm. Baynes, M.L.A., were the nearest residents, with the exception of two or three German settlers. Land could then be bought at 10s. per acre; now it is worth about £5.

The people of the district are mostly of German nationality, and in language and domestic life are but little changed since they or their parents left their Vaterland. A certain number, more especially of the younger ones, have a knowledge of English, but there are many families in which the language of the adopted country is still an unknown tongue. Germans who emigrate to America, with the aptitude of the race for language learning, quickly acquire a good working knowledge of English, but such has not been the case with the settlers at Noodsberg Road.

The railway facilities now enjoyed will doubtless in time help to popularise English, and to break down the isolation now existing. The seclusiveness cannot be good, and must militate, at all events, against the material welfare of the community.

I was in hopes to find some fresh ideas, some adaptations of systems in vogue in Germany, but I found nothing of note whatever. The farms are small, ranging chiefly from 300 to 500 acres, and the cultivation is practically only mealies and a patch of wattle. The wattle patch is a striking feature of the district. A few potatoes and a little forage, buckwheat and mabele are also grown, but the staple produce is mealies. Mealie growing for the last twelve or fourteen years has been profitable throughout the Colony, the average price not having been much below a pound per muid, and the cause of prosperity is therefore not far to seek. Given good seasons, the land about will produce with fertilisers about eight muids per acre, and practically all the land can be easily ploughed. Poultry are raised for profit to a large extent, the Minorca being the favourite breed. Probably no district in the Colony has proportionately a larger output of eggs. Ducks—Muscovies—are also to be generally found at the homesteads. The wattle bark is mostly sold to Mr. von Buelow, who does a large business in this product at the Dalton and New Hanover Stations. The wattle I saw was not thriving as in many parts of the Colony. The district is a dry one, but last year the drought was exceptional.

STOCK.

About cattle Mr. Reiche said:—"Few of us go in for cattle—Mr. Bruyns is one of the few exceptions. All that we aim at in breeding is to keep ourselves in trek oxen, and in milk and butter for the house."

I spoke of the advantages of mixed farming, particularly in this country of rapid fluctuations in the value of farm produce, and asked if dairy work would not hold out a good many advantages in this district of small holdings now served by a railway. Mr. Reiche believed it would, and he hoped at some future date that an accessible creamery might be started.

Horses, said Mr. Reiche, were not bred in the neighbourhood. Mr. Von Buelow had made an attempt, but horsesickness put an end to it.

Formerly there were sheep, but they have been given up owing to the unsuitability of the district. Mr. Bruyns was the last to run them. Mr. Reiche has a dozen Kafir sheep grazing with his cattle. If they continue to do well he thinks his example will be followed.

AGRICULTURAL SHOWS.

This part of the Colony is well off for shows. The New Hanover Agricultural Association was started in 1893, the first President being Mr. E. Peckham. A few years later, owing to strained relations among the members of the society, a considerable number seceded, and resolved on establishing a Noodsberg Road Association. Both Associations hold annual shows. Mr. Reiche was hon. secretary of the New Hanover Association, and on the split, at the strong request of the Noodsberg Roaders, he consented to act as hon. secretary for their Association. This speaks well for his public spirit, for secretarial work is onerous and somewhat thankless, and after a few years it loses its attractions, even for the most enthusiastic. It is almost unnecessary to say that the hon. secretaries for both of the Associations must have a thoroughly good knowledge of English and German.

I asked Mr. Reiche if he was not of opinion that one of the shows was superfluous, and that it would be better if the shows were amalgamated. He replied that the two shows called out a great deal of healthy rivalry, which was very beneficial, and more especially so as the community generally were not inclined to travel, and thus had few opportunities of

coming in touch with outside opinions and new ideas. The exclusiveness or localism of the shows, however, is breaking down.

Mealies naturally constitute the leading feature of the Noodsberg Road Shows. At the last the entries for this cereal were no fewer than 199. Hickory King is the favourite. Mr. Reiche told me that it is now a common practice to burn the mealie stalks, roots and all, before ploughing. The benefit derived in lessening the grub evil is acknowledged on all sides.

In poultry the Noodsberg Road Show does well—well enough to compare favourably with any other Colonial show.

OX HARNESS.

I had the pleasure of seeing cattle in German harness, a pleasure I have not had for many years. A couple of oxen were harnessed to a spider, and with reins Mr. George Reiche drove them round about the homestead. In place of bits, such as are used for a horse, two narrow iron-hinged plates, roughened like a rasp inside, go across the animal's face about half way between the eyes and the muzzle. They appeared to give perfect control. In the picture a neck-bar will be noticed. This bar is necessary for holding up the pole or disselboom of Colonial carriages; in Germany the disselbooms of all vehicles, for oxen, at any rate, are rigid and require no support. The harness is that described in an article by the Director of Agriculture in No. 6 Vol. VI., the design being that of No. 56 on the plate accompanying the article. Mr. Reiche was of opinion that with such harness oxen should be able to pull much more, and he thought that it would be of much convenience to settlers who have little or no native labour. Of course a voorlooper is not necessary when driving. At the last Noodsberg Show a demonstration of driving was given, the oxen having had only three short lessons beforehand.

WINDMILL.

Some three months ago Mr. Reiche erected a windmill primarily for pumping water. How much it is appreciated is best expressed in his words:—"We can-

not understand now how we managed to do without it." It is of German make, 40 feet high, with four main uprights, and is of decidedly superior finish. The well over which it is erected is 104 feet deep, and has a depth of water of about 20 feet. In the framework of the mill is a large tank from which the force of water is, of course, considerable. When this tank is full an overflow pipe conducts the water into a small tank below, which on filling, drops a short distance, and throws the sails out of gear.

ORCHARD.

I was somewhat surprised to see in the orchard a good many fruit trees, etc., of tropical, or rather sub-tropical, order. Plantains, avocado-pears, paw-paws, custard apples and pine apples all do well. There were also a couple of carob (locust bean) trees. The trees are handsome, and should be more frequently planted in the Colony. The specimens I happen to know are very rare. One of the trees is very prolific, but beyond saying that it would probably give a good muid of beans Mr. Reiche could not go. His children pluck the beans as soon and before they are fit for gathering. The tree began bearing when seven years old; the seed was got from Germany.

PASPALUM DILATATUM.

Two seed beds of *paspalum d.* were shown me. One was all that could be wished, the seed rows not showing a gap. The other was a dead failure. Both were within a few yards of each other, and had had the same care—watering morning and night, and had been covered with coarse grass. Here is Mr. Reiche's explanation. There was an interval of a fortnight between the planting of the beds. After the planting of the bed which is such a perfect success, the weather was moist and favourable, while after the planting of the bed which is an absolute failure the weather was continuously dry. The lesson given I considered most instructive. Had there only been the bed which failed the inference might have been that the seed supplied by the

Department was infertile. In this instance the seed for both beds came out of one packet. At some farms one might suspect that the bed which failed did not receive the same watering and attention as the one which succeeded, but at Kort Kranskloof one soon feels that under the management of its methodical owner any such suspicion is idle. On asking Mr. Reiche if many of the German community were cultivating this grass, he said that he had told a good many what he had read in the *Journal* about *paspalum d.*, and that they were also sowing seed beds of it.

DIPPING TANKS; REDWATER.

About dipping tanks there is nothing to write, for there are none in the district. As to ticks they are, happily, never very numerous, and last year they were particularly scarce. Mr. Reiche has never heard of a case of redwater in the district.

DISC PLOUGHS.

A demonstration of the working of a disc plough was recently given by the agents of one of those ploughs, but the result was unforeseen. To show by comparison the capabilities of the disc plough the agents also inspanned an Oliver's New Departure. Seven or eight orders were obtained for the New Departure, but, be it related, none for the disc plough. The field for the trial, Mr. Reiche admitted, was unsuited for showing the advantages of a disc plough; the ground was so open and loose that a walking-stick could be easily thrust for several inches into it. Further, there was a part of an ant heap which the disc plough refused to enter. The common plough was brought up, and went right through it. This, as a matter of fact, does not prove much. An ordinary plough with a perfectly new share will go through almost anything—or smash. It was also considered that the disc was defective in its steering gear. It is to be hoped that before long another demonstration of the disc plough will be given—I speak only of the principle and of no particular make—so that its advantages may be better displayed.

The Culture of Eucalypts.

By T. R. SIM, F.L.S., Conservator of Forests.

(Concluded.)

EUCALYPTUS ROSTRATA, SCHL.

RED GUM.

This, in its several forms, is the most widely distributed Gum in Australia; and in cultivation elsewhere it has shown the same adaptability to a wide range of situations. In Natal it occurs from the coast to Van Reenen's and Newcastle, usually doing well. At Ottawa, trees 10 years old on poor worked out sugar land overlying clay are 70 feet height and 12 inches diameter, while at the Bacteriological Institute, near Maritzburg, there are trees 120 feet high with grand straight boles 18 inches diameter; and at Mr. Topham's at Umsindusi there are many trees 80 feet height and 15 inches diameter, with good clean stems. In the stiff clay and alluvial soil of Ladysmith, surrounded by kopjes, and with a dry hot atmosphere, *E. rostrata* is a perfect success, and so also in other parts of the rather bleak uplands. *E. tereticornis* is simply a form of *E. rostrata*, possessed of all its qualities, and differing most evidently in its heavier foliage and in its bud-form. *E. rostrata* grows naturally on river flats in Australia, and so is one of the few species adapted for growing on flats away from the mountains in this Colony, though it succeeds on the mountains also.

Maiden writing of its occurrence in New South Wales says:—"It is the tree which produces directly to the Colony by far the most revenue of all our trees." In California it has been extensively planted, in very varied situations, and usually with success. Mueller is enthusiastic as to its value for innumerable purposes, but adds:—"It should be steamed or carefully seasoned before it is worked for planking. . . . This or any other timber can advantageously be covered with sawdust to prevent warping and cracking in exsiccation."

Gill states:—"The quality of the timber varies with the kind of habitat. That grown on hilly ground cannot be excelled, though somewhat lighter than that grown in rich moist land, and, according to situation, the weight per cubic foot varies from 50 to 70 lbs. in seasoned timber. The colour is generally dark-red, hence its name; and though sometimes hard it is more easily worked than any other gum. It is admirably adapted for a great variety of uses, either above or under ground, or in water. As fencing posts it will last 30 years and even more, standing unrivalled for this purpose; nor can it be excelled for piles or railway-sleepers when of the best quality, and it resists well both the white ant and the teredo. For shipbuilding, house, and wagon work it is well suited, and also for many minor uses, amongst which it may be noted that it is much preferred for bullock yokes, as it wears smooth without splintering. As a timber for furniture, especially veneers, selected pieces are admirably fitted, the mottled and wavy figure often met with being singularly beautiful; when very dark in colour it frequently resembles the best mahogany. It also makes good blocks for street paving, and an excellent material for parquet flooring. Single trees when felled and converted into sleepers have occasionally produced as many as 100, 220, and even 250 sleepers of the dimensions of 6 feet 6 inches by 8 inches by 4½ inches." Altogether this is one of the most desirable species to grow on a commercial scale in Natal. Hutchins says concerning it:—"It is thus a tree that rejoices in extremes of heat and cold, no great elevation, a rich soil, and alterations of moisture and draught. Unsifted seed averages about 25,000 to the ounce."

EUCALYPTUS SALIGNA, SMITH.

A tree of large size producing timber of first quality, great strength and dura-

bility, used for piles, beams, sleepers, building purposes, etc. Resembles Karri in its clean white stems and horizontal foliage, but is more closely connected with *E. botryoides*, with which it is often confused. Not extensively grown in Natal, but there are beautiful trees at Nel's Rust about 22 years old over 100 feet in height by 14 inches diameter. It is best adapted for the Midland and coastward districts, and should be largely cultivated. It has too many Australian names.

EUCALYPTUS SIDEROPHLOIA, BENTH.
BROAD-LEAVED IRON-BARK.

A large tree of fairly rapid growth, and like the other Iron-barks, of first importance as a timber-tree. Scarce in Natal, though the specimens seen are doing well. Mueller states:—"According to the Rev. Dr. Woolls this furnishes one of the strongest and most durable timbers of New South Wales; with great advantage used for railway-sleepers, jetty-piles, and for many building purposes. It is likewise highly appreciated by wheelwrights, especially for spokes; also well adapted for tool-handles and various implements. Found by us to be even stronger than hickory, and only rivalled by *E. leucoxylon*. It is still harder than the wood of *E. leucoxylon*, but for this reason worked with more difficulty."

Maiden places it third in quality among the Iron-barks.

Mr. A. Selanders writing from Kelvin, Little Tugela, altitude about 4,000 feet above the sea, sends specimens which are easily identified as *E. siderophloia*, and states:—"The trees from which I obtained the above were planted in 1886, and are now about 70 or 80 feet high, with a diameter of about 8 inches. They are comparatively slow-growing; some other Eucalypti—*E. robusta*, *E. globulus*, *E. amygdalina*, etc.—growing alongside and planted same time are four times the size. We have cut down several *E. siderophloias* and have found them magnificent timber for disselbooms in wagons, carts, etc., or wherever great strength is required. A neighbouring wagon maker told me it was the finest wood he had

ever used for disselbooms, and for that purpose was equal to Hickory or Ironwood (*Olea laurifolia*). I am so pleased with the tree that I have 1,000 planted, and intend planting another large area with them."

EUCALYPTUS SIDEROXYLON, A. CUNN.
RED IRON-BARK.

The best known and usually the most successful Iron-bark in Natal and Eastern Cape Colony. Easily known by its rugged, deeply fissured, nearly black bark, veined with kino, and its large seed-vessels, usually set in threes. Formerly confused with, or included in, *E. leucoxylon*, but easily distinguished by its bark as well as by the leaves of seedling plants, which are narrow and alternate, and resemble those of mature trees, while in *E. leucoxylon* the leaves of seedlings are opposite and cordate. *E. sideroxylon* grows in almost all kinds of Natal situations, for though it responds well to moisture and good deep soil, it still continues to live on ironstone gravel and shallow shale and on thorn-veld, when other kinds have died out. While best in the Midlands and on the Berg, it also does fairly well on the upland flats, and also on the coast. Its timber, which is deep-red and splits easily, is of the highest quality and durability, and is well known in Natal and Cape Colony, where a better opinion prevails regarding it than is expressed by Maiden who, in placing it fourth among the Iron-barks, says:—"The wood of this is the deepest in colour, and also the softest and least valuable of the Iron-barks. The tree is often pipy and gnarled, but in some places (*e.g.*, the Mudgee District) is it a fine timber tree. Where one of the other Iron-barks is available, this Iron-bark suffers by comparison; nevertheless it is a useful timber, and is employed in public works for such purposes as railway-sleepers and posts, where long lengths are necessary. Frequently good lengths cannot be obtained, and if they could, the tensile strength of this timber is not equal to that of the best Iron-bark. . . . Red Iron-bark is found principally in the auriferous districts of the western and

south-western interior. It is generally found on poor, sterile ranges, and is usually unaccompanied by any other species of Iron-bark."

In Natal good lengths of clean well-grown stem are not uncommon. McClatchie says:—"In California it thrives in dry soil near the coast, and on the plains and hillsides of many of the interior valleys. . . . It has proved to be entirely unsuited to the hot interior valleys of California and Arizona."

It coppices freely, and I have seen a coppice shoot in ten years make a tree 15 inches diameter and 70 feet height.

EUCALYPTUS STUARTIANA, F. V. M.
APPLE-SCENTED GUM.

Most easily known in its seedling state, when it somewhat resembles Blue Gum (*E. globulus*), though in later life it is more like *E. viminalis*, but with stringy-bark. It succeeds in the Midlands of Natal, and is also fairly hardy, trees in Barkly East doing well where other Gums died out, except *E. viminalis* and *E. pauciflora*. It usually forms a branched tree, and as the timber is of doubtful durability, it can only be recommended for landscape effect, though Mueller states that it is used for fencing and for fuel, and also for furniture manufacture.

EUCALYPTUS TERETICORNIS, SMITH.
FOREST RED-GUM.

Hardly distinguishable as a species from *E. rostrata*, though extreme varieties differ much. It has all the good timber qualities of *E. rostrata*; succeeds as well in all kinds of situations, and at various altitudes; usually has a denser foliage; and in some trying situations, as on the frosty flats at Whittlesea, has stood undamaged while the ordinary forms of *E. rostrata* have been killed beside it. Highly recommended. Common throughout Natal from the coast to the mountains, and usually passed as *E. rostrata*. Mueller remarks:—"Much depends, as regards its durability, on the locality where it is obtained, and the manner of drying, a remark which applies also to many other Eucalypts."

Mr. Maiden reports a post of this timber that remained quite sound for 55 years; according to the same author, Mr. Howitt, the eminent authority on Victorian trees, places *E. tereticornis* at the head of all commercial timber trees of that Colony.

EUCALYPTUS VIMINALIS, LA BILL.
MANNA GUM.

In upland situations where Blue Gum (*E. globulus*) is beyond its natural range, *E. viminalis* is, without doubt, the most rapid growing tree obtainable, and as it keeps feathered to the ground for several years, and afterwards has a graceful drooping habit, and dark-green foliage, it is a great favourite for ornamental and shelter belts, where few other kinds will survive. In Johannesburg it has been largely planted with a view to being used for temporary props, etc. In the deep valleys of the Yellow-wood belt it produces grand clean trunks, but on more shallow soil and on shale ridges it is apt to form a branched spreading tree of low stature and of no timber value. Even when well grown the timber is not durable in the ground, and less strong than many other Gums, consequently its timber value is low, though its timber-production is great. Even for fuel it is not recommended. Its chief value is for break-winds and shelter trees in cold frosty districts, or for props of a temporary nature. In Australia in suitable situations it grows occasionally to 300 feet in height and 15 feet diameter.

No man can make good butter from poor milk,
but many make poor butter from good milk.

Mr. C. T. Murphy, Barbados, writes:—"With regard to the snakes of Barbados, the only place where the larger species may still possibly exist, is along the windward coast of St. Andrew. I last saw one about five years ago, about a yard in length, and of a grey colour. Before the introduction of the mungoose they were frequently found under cow-pens, but now they seem entirely extinct in the interior. The Guana lizard also seems to have been driven to this part of the parish as a last resort by the mungoose. It is rarely now that one is seen."

Horsesickness.

THE following paper on Horsesickness was read by the Government Bacteriologist, Mr. H. Watkins-Pickford, F.R.C.V.S., before a meeting of the Inanda Agricultural Association on the 9th inst. The report of the discussion is taken from the *Mercury*.

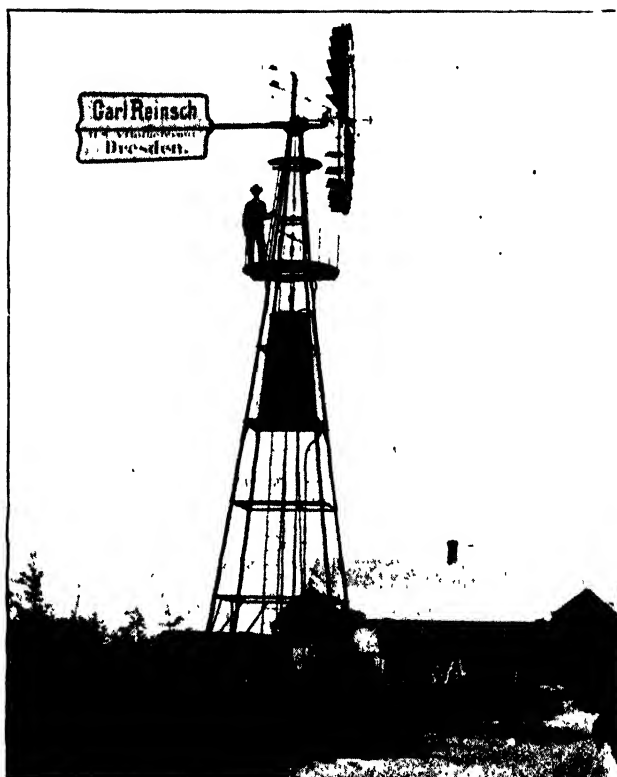
In dealing with the history of South African Horsesickness we cannot, as with such diseases as Tuberculosis or Rinderpest, avail ourselves of the observations, and works of men of bygone ages, our earliest disease-history being comparatively recent, and dating only from the first decades of the 18th century. The earliest record of the existence of the disease in South Africa is in the year 1719, when it seems to have assumed a spreading or epizootic character, and swept over Cape Colony, destroying a large number of horses. It is probable that the disease existed before this, but did not attain any great dimensions owing to the thinly settled state of the country, and the consequent absence of that inseparable friend and servant of man, the horse. While in regions around the equator the disease, as we have seen, is active at all times, we shall notice as we come south, that is as we approach more temperate latitudes, to that degree the disease of Horsesickness tends to become periodic, or intermittent throughout the cooler months of the year, and as we leave Mashonaland and Matabeleland the country south gradually becomes free from the risk of Horsesickness throughout certain months of the year. When in Salisbury, Rhodesia, last year, I saw a typical case of Horsesickness in the depth of winter, and was informed by Mr. Grey, the chief veterinary surgeon, that such cases were by no means uncommon. Even in Natal many must have heard of such cases (especially on the milder coast of the Colony), but as a general rule Natal and the Cape Colony enjoy an almost entire immunity during some six months of the year. In fact, it may be laid down in general terms that the disease Horse-

sickness is connected with the mean temperature of the district. Exceptions, of course, occur, but we may say, with confidence, that the incidence of the disease is greater upon those districts possessing by their characters milder and more sub-tropical conditions of climate. Further than this, abundant evidence is forthcoming as to the intimate connection of outbreaks of the disease during or following seasons of exceptional rainfall. Coastal districts, river valleys, as the Tugela or Umfolosi, swamps and districts well watered and wooded, are especially liable to its ravages, and the occasional outbreaks on the high veld of the interior have a direct relation to the rainfall, and probably the level of the sub-soil water. Humidity and warmth then are accepted factors in the production of the disease, or if not concerned directly with its production, are at least invariably associated with that sweeping epizootic form of the disease which occasionally devastates our stables. That the germ of Horsesickness can lie dormant in the system of the horse for a lengthy period, much longer in fact than the usual period of incubation, I have frequently proved in my experimental work with this disease; and this fact is the more interesting when one considers the usual rapid and certain symptoms produced by the disease when gaining access to the horse's system by inoculation, or in the usual way. I have within the last two years expressed my opinion as to the cause of the disease in the form of official reports, etc., and probably many gentlemen present will have thought over the matter more or less since reading or hearing of these expressions of opinion on my part, and I may say at once that I shall gladly welcome any expression of views from men of greater age and Colonial experience in the disease, even though such views may controvert or tend to destroy the theory which I have put forward. I believe that South African Horsesickness is spread chiefly, if not solely, by means of

suctorial insects, and the conclusions that such are flies (and probably mosquitoes) the rapid transmission of the disease would seem among other considerations to warrant. To deal with this point first. I will endeavour briefly, and as clearly as I can, to enumerate the possible modes of infection, by which, of course, we understand the manner in which the disease might be contracted by horses. One of the usual manners of contracting a disease is by contact, *i.e.*, contagion. Now a very short survey of the disease will suffice to show us that simple contact, or association, however close, of a sick and healthy horse does not produce Horse-sickness. Examples of this method of infection would be found in Rinderpest or small-pox, etc. To every instance in which two animals in a stable have taken the disease simultaneously, probably 500 instances could be brought forward showing that horses on either side of the sick animal remained for the time being perfectly healthy. In fact, I think we are justified in being dogmatic on the point, and in saying that Horse-sickness is not transferable from one horse to another. Does the horse then pick up the germs of the disease with his food, or water, or does he breathe them into his system as he inhales? Here we arrive on more debatable ground, ground which as we all know has been very well traversed by layman and professional alike for some three or four generations past in South Africa. As we have seen, the disease by general consensus of opinion is not contagious, *i.e.*, it cannot be caught by the close contact of a sick horse with healthy ones. Neither is it directly infectious, scattering the germs of the disease about in mangers, horse troughs, clothing, etc., as in the case of glanders. We are all agreed, I think, on these points, and confirmed in our scepticism concerning such agencies as spider webs, cold draughts, sudden changes of weather, etc.—such questions cannot bear even superficial investigation. There remains, however, among other things the possibility of the horse becoming infected by ingestion, or, as we call it, “by something he picks up,” either with his food or water, or in the air he breathes into his lungs. We all of

us know the universal theory of the association of dew with the disease, some going so far as to attribute to the dew itself the actual production of the disease. I know that this theory is very widely spread, in fact the so called dew theory is held to-day by a scientific worker in South Africa, who, from his lengthy experience and facilities, can bring forward more reason for the faith that is in him in this respect than probably any other worker with this disease. The facts supporting this dew theory are briefly as follows:—Practical horsemen have noticed first, that the more efficient the stabling the greater the protection afforded; secondly, that horses can be safely exposed about the time the grass becomes dry, by reason of the evaporation of the dew, and that when the grain is moist (*i.e.*, during the evening, night, and early morning dews) is a time at which the disease is liable to be contracted. During the continuance of wet weather there is little dew, and little risk; and several such arguments lend themselves not unnaturally towards the proof of the causation of Horse-sickness by dew. Such dew was supposed to be inhaled as the horse grazed amongst the tufts of grass and herbage, or was swallowed with the food; and it has been frequently suggested, in order to account for the presence of the microbe at certain hours only on the ground and herbage, that the dew entangles the microbe, which is floating in the air, and this causes its subsidence or precipitation on the herbage, which thus becomes dangerous, as it becomes dew-laden. That such a process as this is impossible a very brief consideration of the principle of dew formation would show, for, as we know, dew does not fall like rain, but is condensed, as it were, only upon the actual surface upon which it appears—in a similar manner, in fact, to the moisture, which condenses from our warm breath on a cold window pane. The idea, therefore, of falling moisture bringing down the fatal germs, and depositing it on the ground, is not to be entertained. Besides, if it comes from the air in this manner, why are not all the horses in the district suddenly affected simultaneously? I have collected dew in





GERMAN WINDMILL AT NOODSBERG ROAD.

(See Interview with Mr. Fritz Reiche, J.P.)

quantities during dangerous seasons from localities as dangerous as I could secure, and I have not only drenched horses with dew, but have introduced the same directly into their veins—which is the most certain of all methods of producing the disease, even when the merest trace of the disease exists—but my results have been always, as I expected they would be, entirely negative. I think, gentlemen, you will in justice then preserve a very open mind towards the dew, and remain at least unbiassed against this agent until much stronger evidence of its guilt is forthcoming. Is then the evasive and malignant cause to be found in poisonous herbs or roots? I think the owners of large stables in Durban and elsewhere will promptly deny the possibility. Innumerable instances of horses kept strictly on dry food (corn and imported hay), and receiving no grass or herbs, green or dried, will be brought forward to prove that infection has nothing to do with poisonous herbs. Perhaps the drinking water becomes contaminated? Evidence has often pointed to infection occurring when animals were taken to water. But no evidence is forthcoming of general infection being contracted in this way, that is, though many horses may have drunk at the same spot about the same time, all have not taken the disease; and I may say here that I have a number of instances in which horses have become infected where no water has been given, except that which has been boiled and allowed to cool, with the cover kept carefully on the boiler during the process, to prevent possibility of contamination. It has been thought by some that the germ may be carried about with currents of air and by wind, and that it may be inhaled, and causes infection in this manner, and so account for those sweeping attacks which destroy numbers of horses during a bad season. Here again, however, the same objection is insuperable, just as with the two men working in the field where the one is taken and the other left. Such conditions of infection as above, by water and air, would necessarily be uniform and general in action, while the contagion of Horseshickness is erratic and irregular to a degree. We have here, I

think, excluded food, water, air, the dew, cold, and heat, and climatic conditions as also other agencies, whether eaten, drunk, or inhaled. There remains the possibility of inoculation or the introduction of the cause of the disease into the system through a puncture of the skin, such as happens in the infection of the ox by the tick in redwater or infection of man with malaria, and in numerous other instances of disease production. It will be known to most (if not all of you) that I hold the opinion that Horseshickness is produced by the bite of a flying insect, and I was led to attempt a proof of this theory by consideration of the various points which we have just enumerated. All of these seemed wanting in some one or other vital particular, and the theory of the insect-production of the disease was forced upon me as much by the process of elimination of possible other causes as by the strong parallel or analogy existing between Horseshickness and human malaria. Since then a stronger parallel has arisen, in the case of yellow fever in man (which has been such a dreadful scourge in the West Indies and elsewhere), for this disease has lately been shown to be due entirely to infection through the inoculation of human being by a species of mosquito. In this disease, yellow fever, the microbe of the disease is too small to be seen even by the most powerful microscopes, and this, as you probably know, is true also of the microbe of the disease Horseshickness. If we now consider briefly the possibilities of the disease being produced in the horse by the attack of an insect (such as the mosquito), I think we shall come to the unanimous opinion that such a means of spread of the disease is probable. We shall, I think, be prepared to admit it as conclusive evidence. The details of the recent investigation with the object of proving the agency of insects in the production of the disease may be probably unknown to some of you, so I will very briefly give you the main lines of the inquiry.

A number of horses were taken from Natal into a locality by repute most deadly for the disease, with the object of proving that insects were concerned in its production. On the advice of Mr. Saun-

ders, the Chief Magistrate and Civil Commissioner of Zululand, I placed my experimental camp in the Begamusi Valley in Zululand, and the deadliness of the locality fully bore out Mr. Saunders's opinion concerning it. The intention was to maintain certain animals in such condition and amid such surroundings that, while they were protected against the possibility of insect attack, they could at the same time breathe whatever miasma or germs the air might contain, and be made to inhale or swallow any infective dew or herbage which grew in the vicinity, and in fact be subject to all possible conditions of infection except in respect to their protection from flies of all sorts. Now this protection was effected in two ways, the first of which was by placing a horse in a light frame-work box, the walls of which were formed by sheets of fine gauze netting (No. 32). Through the walls of this box the contained animal was clearly visible, and currents of air could circulate with the greatest freedom. It is not probable, therefore, that germs which are too small to be seen by the most powerful microscope, and which are able to squeeze themselves through the pores of the densest porcelain filters, would experience much difficulty in gaining access to this test animal under observation in the gauze box. The food of this animal in the box was grass, cut early and late where wet with dew, and eaten while still quite fresh. I am satisfied, therefore, that the possibility of atmospheric infection and dew-laden grass was adequately provided for. Other horses were now tethered to posts in the open air, as close to this box as possible, and these animals (which I call the control cases, or simply controls) were subjected to exactly reverse conditions, *i.e.*, they were liable to insect attack, in the absence, of course, of any protection, and received no green food or herbage of any kind, to ensure which the earth upon which they stood was dung, and then well burned over and trampled hard, so that no blade of grass was in their reach, and their corn and hay—their only food—was fed to them from movable mangers, taken away and covered up so that the dew might not fall on them, di-

rectly the horses had finished their feeds.

If, therefore, atmospheric influences were concerned in the production of the disease all these animals should have been equally infected, for their condition in this respect was identical; if dew-laden grass, or other deleterious green food was concerned, then the horse in the box should alone become infected. And further, in case it should be urged that the drinking of natural water caused the disease, the control animals, that is those horses standing round about the box outside, and receiving the dry food, received also nothing but boiled water, while the horse in the box was watered from the spruit alone. With the result of this experiment, gentlemen, you are probably familiar—the horses outside the box fell victims to the disease, and were replaced by other fresh horses, which, in their turn, succumbed, leaving the horse in the box close at hand absolutely healthy. The other method of protection was by stabling the horses it was sought to protect in a smoky atmosphere. For this purpose two rough wattle and daub stables were erected, and horse dung fires were set smoking about sundown in the doorway. During the day some of the animals thus stabled were permitted to graze naturally, but were brought up as the sun got low. Four or five control horses picketed round about went down one after another with the disease—for the district was a very deadly one—but no case of sickness occurred amongst the horses in that rough stable in which the air was kept smoky by a smouldering fire. Thus, by a gradual process of elimination, a weeding-out, we have shown that most of the factors in influences which we have been taught to regard with suspicion are harmless, and we must admit the possibility of a disease-producing-something unconnected with food, unconnected with water, unconnected with wind and atmospheric influences, with dew, and even spider web. It must be capable of rapid transmission, it must be associated with moisture and absence of sunlight, it must be absent during heavy rains, but prevalent afterwards; cold weather checks it, a fine

gauze debars it, and when it travels it certainly does not prefer a smoking compartment. What will now satisfy our equation? Take the mosquito, and try and fit it to the solution of this interesting puzzle, which has defied us so long. A flying insect, active about sundown and sunrise (times which experience has taught us to avoid), fond of moisture, avoiding the sunlight and the heavy rain, and being most vigorous and aggressive in the close and sultry weather of our summer climate, which coincides with the period of our greatest danger. The mosquito occurs to all of us. I have spent many an hour on a summer's night, with my zealous assistant, Mr. Henry Power, walking round and round a lantern suspended in a mosquito net in suspicious localities observing the nocturnal insects attracted by the lamplight, and, with one rare exception—too rare and inconstant to be given serious consideration—the insects so observed have been mosquitos of various sorts, and harmless moths, etc. What objections can we urge against the theory? I have frequently been met with the objection that mosquitos exist sometimes in great numbers in places, and at times, when no Horse-sickness can be heard of. This certainly is so, and the objection has been even more frequently brought as to the possibility of human malaria being transmitted by this means in other countries. The fact is that a special species of mosquito is necessary to the spread of malaria, another to that, or yellow fever, and the same may be proved to obtain in Horsesickness. Certain known varieties of mosquitos can produce, even in small numbers, when infected, an extraordinary disturbance of the system of a horse, and such a fact, in conjunction with the fact that horses protected from mosquitos are protected from Horsesickness, lends the strongest presumptive evidence to the correctness of the theory that the disease is produced by the mosquito. This is my impression at the present moment, though the scientific worker can call nothing by the name of fact until proof, most far-reaching and irrefutable, is in his possession.

In the course of the discussion which followed,

Mr. Townsend said his experience had proved conclusively that the only method of preventing the sickness was to smoke the stables thoroughly. From the time he had smoked the stables he never lost a horse, and this was the case at the Seacow Lake estate, which was supposed to be the most deadly spot on the coast.

In answer to Mr. Stansell, the P.V.S. said that a rise in the temperature of a horse was significant of the existence of the virus in the system, but whether it was a serious symptom he could not say. Yet where an animal was fresh to the district, he should regard the rise of temperature as a danger signal.

Mr. Saunders said that they had been successful in cases of Horsesickness by administering a mixture of spirits and ether.

Mr. Watkins-Pitchford explained that the sickness was rather a heart than a lung trouble, and probably the administration of alcohol would help to the recovery of a horse.

Mr. Jackson said he had also found the smoke treatment very successful.

The President, proposing a vote of thanks to Mr. Pitchford for his paper, said he looked hopefully to much good being achieved from the P.V.S.'s investigations.

Mr. Hulett, seconding the proposal, said the Government should be urged to give the veterinary officers every support in the continuation of their work.

The motion was carried with acclamation.

The exodus from Victoria, says the *Pastoralists Review*, to South Africa is increasing at an alarming rate. During the first six months of this year 1,747 persons left for South Africa, and the arrivals do not total 200.

Recent experiments at the Dominica Botanic Station, touching the application of manures to orange trees, indicate that where bananas are growing intermixed with orange plants, the application of special manures to the latter is useless. The banana being a fast, gross feeder deprives a slow-growing plant like the orange of much of the plant food intended for it.

Veterinary Departmental Report for August, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of August, 1903 :—

Scab.—Forty fresh outbreaks have occurred during the month. Klip River County, 16 ; Weenen County, 7 ; Umvoti County, 2 ; Upper Umkomanzi Division, 4 ; Lion's River Division, 4 ; Polela Division, 1 ; Impendhle Division, 2 ; Ixopo Division, 1 ; Alfred Division, 1 ; Vryheid District, 1 ; Paulpietersburg District, 1.

Lungsickness.—Several fresh outbreaks have occurred during the month. Klip River County, 2 ; Weenen County, 1 ; Ixopo Division, 1 ; Vryheid District, 1 ; Paulpietersburg District, 1 ; Zululand, 1.

Anthrax.—Eleven deaths reported.

Glanders.—Eight clinical cases have been destroyed during the month, and 11 which reacted to mallein.

Rinderpest.—The Compulsory Inoculation Bill, which was passed by both Houses of Parliament during the present Session, has not yet been gazetted as Law. I trust that we shall be able to enforce inoculation at an early date. By this means we can deal more satisfactorily with the more or less isolated centres of this disease which now exist in Zululand, and the Vryheid District bordering on Zululand, amongst Natives' stock. There are many owners having cattle in Zululand who are anxious to return them to Natal, and the first step to enable us to meet these owners is for the Compulsory Inoculation Bill to be brought into force.

In the Vryheid District two fresh outbreaks occurred during the month. One of these was in the vicinity of the Pongola, amongst cattle which had secretly been brought across the river at night. These animals were all destroyed.

Rhodesian Tick Fever.—At the end of the month this disease existed at two Native kraals in the vicinity of the Ingwavuma Magistracy. Unless the cattle which are not suffering from the disease

are removed from the actually infected veld on to clean veld in the vicinity, after having been thoroughly freed from ticks, I fear that the disease will occur periodically while any cattle remain on this infected veld. We should endeavour to starve out the infection. While cattle remain in infected veld, they are submitted to constant infection, and, although daily dressing for ticks did check the disease, from our experience at Ingwavuma we cannot say that this dressing controls the disease. We have no dip at Ingwavuma, and the dressing for ticks has all been done by means of spray pumps. This, of course, cannot be so satisfactory as dipping. You will notice from the reports that the officers responsible for the guarding of our Northern Border against the introduction of cattle report that this guarding is being efficiently carried out.

Quarter-evil.—37 deaths have been reported—the majority on the coast. Owners should resort to inoculation, particularly at this time of the year, and it should be remembered that the immunity conferred does not last longer than six months, if as long.

Vegetable Poisoning in Cattle.—38 deaths have been reported, tulip being the chief cause, as is to be expected at this time of the year.

I put up reports from the D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT.

P.V. Surgeon.

P.V.S. Office, P.M.Burg,

10th Sept., 1903.

MOOI RIVER.—D.V.S. VERNEY.

Rinderpest.—The quarantine was raised from the farm Sans Souci on the 24th inst., a period of three weeks having elapsed since the last affected animal ceased to be a source of infection. I certainly hope this will be the last out-

break of rinderpest I shall have to cope with in Weenen County.

Lungsickness.—Two more cases of this disease having occurred amongst the cattle on Weenen Commonage has necessitated a further issue of a six weeks' quarantine period. The disease is showing itself in a mild form, which is very common nowadays, and as is usual in these benign outbreaks, the period of inoculation generally extends from 6—12 weeks, and so again furnishes another of the already numerous instances of how defective the Lungsick Law is, in only compelling a six weeks' quarantine after the last case of disease.

Sheep Scab.—As is usual at this time of the year there has been a considerable increase in the number of outbreaks of this disease.

Choking.—A fatal case of choking in an ox came under my observation. The ox was choked with a piece of turnip, and the owner, in trying to remove it, used some rather stiff wire, and in doing so, lacerated the throat for about 3 inches. The septic matter produced by the arrested turnip quickly became absorbed into the tissues upon this wound, and set up immense swelling that simulated the lesion caused by the bacillus of malignant oedema, and when I saw the ox a short time before death he was swollen from his nose to his tail, the swelling or percussion giving the appearance of the characteristic lesion of quarter-evil.

Stock owners, in dealing with cases of choking, should remember that in the absence of a proper probang, an ordinary carriage whip answers well for removing any obstruction in the oesophagus, and that in passing this it is much easier to do it when the animal is standing, as in this position one is much better able to keep the head in a straight line with the neck.

Inability to get rid of the after-birth in cows has been common lately. This, I think, is largely due to bad condition of the animal, and want of succulent food. If animals affected in this way are given half a pound each of Epsom salts and brown sugar, and the womb well washed out daily with a warm weak solution of

Condy's Fluid, recovery usually takes place.

DURBAN.—D.V.S. AMOS.

The importations by sea have been as follows :—

Sheep	10,576
Horses	510
Mules	144
Dogs	36
Heifers	4
Bullocks	4
Oxen	2
Deer	1
	<hr/>
	11,277

Of the sheep, 6,315 came from New Zealand, 3,931 from Australia, and 330 from Madagascar. The sheep from New Zealand and Australia arrived in very bad condition, and were ordinary stores, quite unfit for slaughter, and were refused to be taken by the consignees on this side. The average weight when dressed was 38 lbs., and many deaths have occurred from pure exhaustion since landing. They could in no way compare with the sheep we have been used to see from the Argentine. The 330 sheep from Madagascar were ordinary native sheep. Of the horses, 324 were S.A.C. remounts from Australia, 175 came from Argentine, and included some heavy cart stallions; 7 came from England, and 4 from New Zealand. The 141 mules came from Argentine. The dogs came chiefly from England, and many were sent direct to Johannesburg. The bulls and heifers came from England, and were South Devons and Shorthorns. Tabulated, the countries supplying were as follows :—

New Zealand	6,322
Australia	4,270
Madagascar	330
Argentine	319
England	36
	<hr/>
	11,277

Lungsickness.—I am glad to say no fresh outbreak has occurred. Four herds

are now under license. I have visited the herds at Pinetown and Botha's Hill during the month. I regret the Law does not give us power to act over a beast that has been badly affected and has recovered, as one of these herds has now been under license for some considerable time, and has been renewed again from August 2nd, simply because an old "lunger" is still coughing when hurried, and this state of affairs will apparently go on indefinitely, as you cannot certify the three head, which includes this old "lunger," a clean herd.

Glanders.—I have destroyed 6 clinical cases and 13 reacted horses during the month, and made *post-mortem* examinations, and in each case Glanders lesions have been present in the lungs.

Tuberculosis.—Seven head have been tested, and one bull gave a suspicious reaction, so has been detained here for retesting.

GREYTOWN.—D.V.S. CORDY.

Scab.—Two fresh outbreaks.

Lungsickness.—None.

Glanders.—None.

Rinderpest.—None.

Vegetable Poisoning has not up to the present been the cause of many deaths this spring. Mr. J. H. Van Rooyen, of Kromberg, lost five head of cattle in two days, and on the matter being reported, I visited his farm to investigate the cause of death. No other animals were sick, and the carcasses of those dead had been destroyed, so that I was unable to make a *post-mortem* examination. When seen to be sick, they were said to be blown up very much, and died suddenly. On being opened, the intestines were said to be much inflamed. I feel confident that nothing but vegetable poisoning was the cause of death. When at all suspicious of this disease, a bold dose of purgative medicine, such as a couple of pounds of Epsom salts with an ounce of ginger dissolved in a gallon of warm water, should be administered at once. Should the animal be much blown up when first seen, it would be better to substitute for the former a quart of raw linseed oil with a wineglass of turpentine, well

shaken up, the latter ingredient assisting to dispel the gas formed in the intestines. These doses are for full grown beasts.

Heartwater was responsible for over forty deaths among sheep in the Western Umvoti District.

Gallsickness.—Nine deaths were reported from this disease.

Quarter-evil.—Only three cases were reported.

Dunsickness is not at all prevalent in this District, but I was called to see a horse which proved to be suffering from the disease in its last stages, and, not being able to give the owner any hope of recovery, the animal was destroyed.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Two fresh outbreaks; both are in the Newcastle Division. The herds belong to Natives.

Mange.—In goats, four outbreaks; horses, six. On the whole, for this time of the year, stock generally is in good condition throughout my District. Skin disease and vegetable poisoning have given the most trouble during the month. The former chiefly among horses and goats, the latter, in the form of vegetable poisoning, among cattle. The total number of deaths reported as having occurred from vegetable poisoning amount to 27. Fourteen animals belonging to a small herd of Madagascar oxen died from the effects of tulip. This class of cattle, when freshly imported into the Colony, feed upon the plant most greedily, and when they gain access to the poison generally consume such a large quantity that death often occurs before it becomes possible to prescribe a remedy; especially is this the case when animals become ill during the night.

Rhodesian Tick Fever.—From reliable information I gather that no cases of this disease exist in the proximity of my District. The nearest cases being below Riet Retief, in the Transvaal. The Wakkerstroom District is free from the disease, and if at any future date infection should be brought there, the Government Veterinary Surgeon has promised

to notify me of the fact immediately. I have visited the whole of the Transvaal-Utrecht border during the month in company with the officer in charge. The border is effectively guarded, and nothing less than a barbed-wire fence could render it more secure against the entry of cattle.

IXOPO.—D.V.S. POWER.

Scab.—Two fresh outbreaks during the month, one in the Ixopo Division, and one in Polela. Three flocks under license in Polela, and one in Ixopo.

Quarter-evil.—Three outbreaks of this disease occurred during the month, causing eight deaths. In all cases where inoculation was resorted to the disease was immediately suppressed.

Lungsickness.—The outbreak of this disease at Highflats has been the subject of a special report to you.

Redwater.—One fatal case in a cow brought from the Belg to Ixopo.

Retention of the After-birth.—Quite a number of cases have cropped up during the month, and those that I have seen have been mostly in young, poor cows. A dose of Epsom salts to the cow, and a light weight, such as an old horse shoe, tied to the protruding membrane, answers well in a great many cases. If this treatment is not effective, the membranes should be carefully removed by hand; but should not be dragged away roughly, as serious internal damage might be caused.

Glanders.—Nil.

I am sure it will not be considered out of place here to refer to the sad loss the Division has sustained by the death of Mr. Thomas Foster, of Stainton, Ixopo's oldest and most successful stock breeder. Mr. Foster imported largely for a great number of years, and his enterprise met with a considerable amount of success. Not only Ixopo, but the Colony generally, can ill afford to lose men of Mr. Foster's stamp.

VRYHEID.—D.V.S. CROLE.

Rinderpest.—At the beginning of the month three outbreaks of this disease

existed. The first mentioned outbreak was quickly stamped out owing to the Natives' willingness to inoculation. The outbreak at the Babanango is serious, and involves about ten kraals at present, besides a troop of 600 head belonging to Mr. J. White.

Rhodesian Tick Fever.—I am pleased to be able to report that at present we have no case of this disease in these districts. Every precaution is being taken to guard against its introduction. An efficient staff of border guards, consisting of Natives under charge of Europeans (the latter chosen for their local knowledge), is now patrolling the Pongola river, and guarding all places where it is possible to cross cattle.

Lungsickness.—During the month two fresh licenses have been issued, and six have been raised.

Scab.—In Vryheid District there has been one fresh outbreak of scab during August. Five flocks have been released from quarantine, and six remain at present under license. In Paulpietersburg District there is only one flock affected with the disease.

Horsesickness.—One death has been reported of Dikkop, and two of the pneumonia form of Horsesickness during the month.

Glanders.—One horse has been destroyed at Vryheid, and one at Paulpietersburg.

Gallsickness.—Three cases of Gallsickness have been reported, and one or two deaths from other sporadic disease or unknown cause. Taking everything into consideration, the general health of stock in this District is good, and when the Stock Laws have been in operation a little longer there will no doubt be a still further improvement.

MARITZBURG.—D.V.S. FYRTH.

Scab.—Four outbreaks have occurred in the Upper Unkomanzi Division, and the flocks are under license. One owner, a Native, Seyaga, is being prosecuted for not having notified the Stock Inspector of the outbreak among his sheep.

Lungsickness.—No cases have occurred during the month.

Glanders.—One clinical case occurred at Camperdown. This horse was dead on my arrival, and *post-mortem* examination revealed an acute attack. Two in-contact horses were tested with mallein, and one of these gave a typical and pronounced reaction, and was thereupon destroyed.

General.—Four deaths in oxen from Gallsickness have been brought to my notice, and one death from snake bite. Stock generally is healthy and in fair condition.

LADYSMITH.—D.V.S. O'NEIL.

I have been busy in the Klip River Division throughout the month, and tested several horses with mallein, besides making *post-mortems* on cows that succumbed to vegetable poisoning.

Abortion.—Quite a number of abortion cases occurred amongst cows which received my professional attendance, and those cases I attended were the result of accidents.

Scab.—We are endeavouring to eradicate scab from the District, and it is impossible to do so without the co-operation of the owners. I regret to state that those cases I brought into Court were thrown out on some technical point.

Lungsickness.—One fresh outbreak occurred.

Anthrax.—Five cases are recorded in the Klip River Division.

Redwater.—Only one case is reported.

Quarter-evil.—Seven deaths are reported from the Umsinga Division.

Tulip Poisoning.—Two cases are reported.

Asthenia.—Three cases are reported.

Vegetable Poisoning.—Several cases occurred throughout the District, and succumbed.

Abortion.—Quite a number of cases are on record during the month.

Mange still exists amongst horses and goats in the Umsinga Division principally amongst Native owners.

VERULAM.—D.V.S. SHARPE.

Scab.—One flock of 22 sheep affected.

Lungsickness.—None.

Glanders.—None.

Rinderpest.—None.

General.—On the 17th I started with Stock Inspector Robbins for a tour through the Mapumulo Division, touching at Umhlati, Stanger, Kearsney, Thring's Post, Mapumulo, Glendale, Reit Valley, and home again. This took us just a week, and everywhere on our way we found stock very healthy, though they were feeling the drought, and everyone was anxiously expecting the rain, which came just as we got back here. In Glendale it was very dry, and acres of cane were destroyed by the drought. During the month there have been 19 deaths from Quarter-evil and 7 from Gallsickness, but with these exceptions, stock are very healthy.

Horsesickness.—There has been a reported case of Horsesickness. Mr A. S. L. Hulett lost a horse. I did not see it, but it is most exceptional at this time of year.

HOWICK.—D.V.S. WEBB.

Retention of the Foetal Membranes in Cows.—I have been called in to attend a considerable number of cows for the above condition, or rather for the diseases which have resulted from allowing the membranes to remain in situ when they should have been removed. I should like to draw the attention of farmers to the simple means by which the after-birth can be removed, etc., if the subject has not previously been written about in the *Agricultural Journal*.

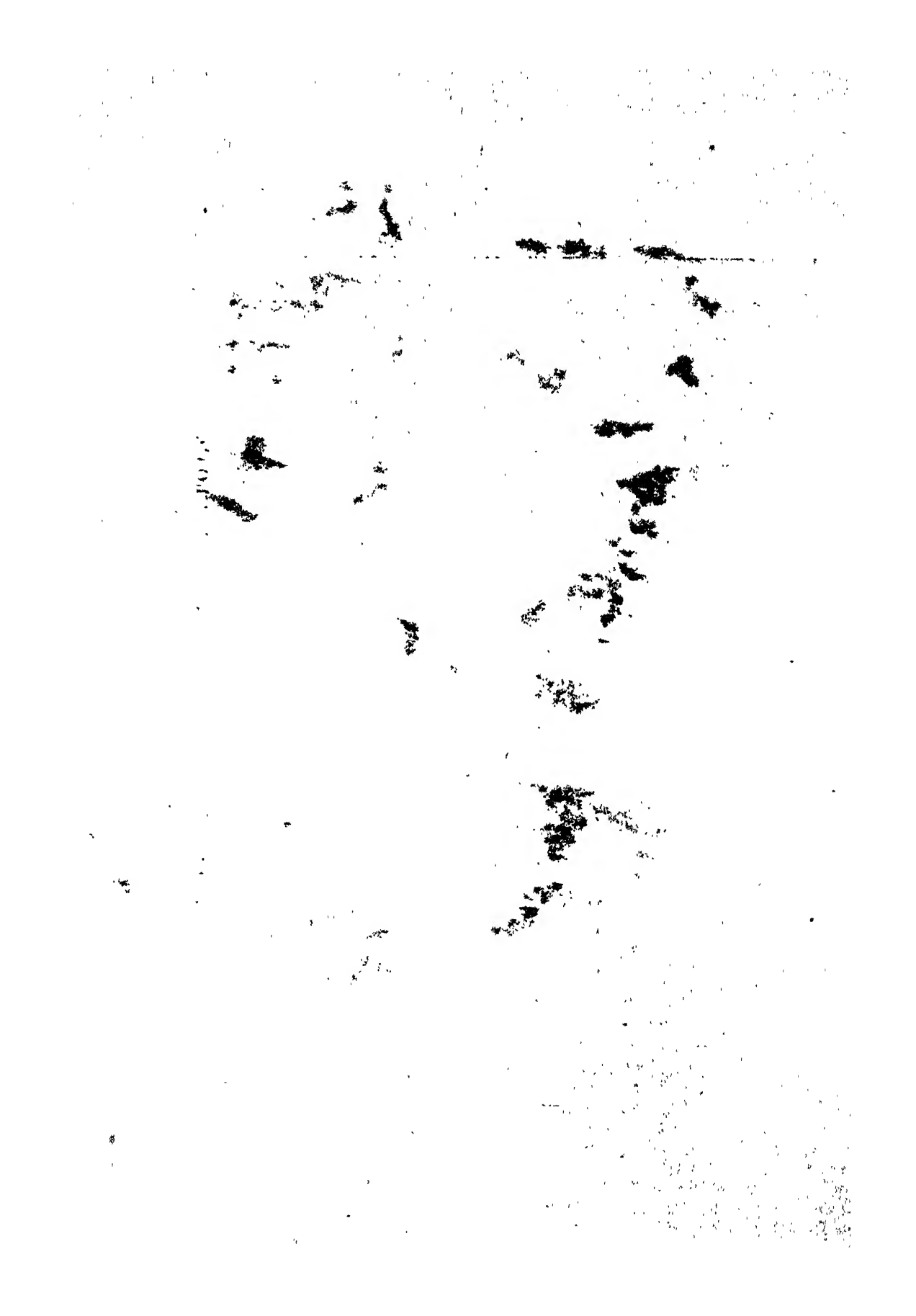
Many stockowners do not attend to their cows soon enough when they see that the "after-birth" has been retained beyond the normal period of time, or content themselves with tying a brick, stone, or a few old horse shoes to the membranes. The cause is undoubtedly in some way connected with the food supply, which is either insufficient in quantity or deficient in quality. In consequence the animals' systems are not properly nourished at a time when they are in particular need of extra nutriment.

Retention of the afterbirth is always more prevalent during the dry season



GERMAN OX HARNESS AT NOODSBERG ROAD.

(See Interview with Mr. Fritz Reiche, J.F.)



when the grass is lacking in quality, if not quantity, and occurs more frequently in heifers after their first calving. The direct cause is probably due to want of tone in the maternal placenta (the collections of vascular bodies connecting the foetus to the mother). Preventive treatment would consist in bringing up cows, down to calve during the winter months, a few weeks before their time is due, and to feed them if possible on a food of laxative nature, such as green stuff, oil cake, etc. If this were done, the number of cases would diminish considerably. It is the custom in many parts of the Old Country to give cows a "cleansing" drink after calving. These usually consist of a gentle laxative combined with a carminative and stimulant, and I think such a drink often does help in producing the desired effect. They are certainly more likely to have a beneficial action than some of the mixtures which I have heard prescribed in Natal, such as "soot and vinegar, and a bar of blue mottled soap."

A drench having the qualities of laxative, carminative and tonic, might consist of—

Powdered nux vomica	2 drams
.. gentian.....	2 ounces
.. ginger.....	2 ounces

Mix with a quart of warm water, or, better still, linseed tea, and then add about a pound of thick treacle. Such a drench should be given directly after the cow has calved, and, if necessary, could be repeated for two or three days. It is best if the membranes do not come away within two days, or three days at the longest, to remove them mechanically. If they are left a longer time putrefaction will have become thoroughly established, and then it makes their removal a decidedly unpleasant business, and a much more difficult one, as the membranes will break with the least traction; and further, the mouth of the womb daily decreases in size until it becomes impossible to get the hand into the womb, and the membranes can only gain exit by breaking up under the action of putrifiactive organisms, and come away in a stinking semi-fluid condition. While this is going on, the cow looses flesh, becomes tucked up, and gives

little or no milk; in many instances metritis (inflammation of the womb) is the result, or septicoemia (blood-poisoning), caused by the absorption of the products of putrefaction, both of which conditions may prove fatal. The irritation set up in the uterus might, should the cow recover, so alter its walls that pregnancy would be delayed, or become altogether impossible in the future. Whether such is actually the case I cannot say with certainty, although it is quite reasonable to suppose such a condition, for instance as schirrous or (hardening of the mouth of the womb) would occur.

A simple way to remove the membranes, and one which answers in nine cases out of ten, is to take two sticks, each about 3 feet long and as thick as an average sized walking stick, place the exposed end of the membranes between them, turn the sticks, and so twist the membranes around them, until the vulva (external opening of genital organs) is reached. The turning must be done slowly. At the same time a fair amount of force must be used, if the operator will take plenty of time and use patience, he will find the membranes can be gradually twisted round the sticks, and the whole of them removed without any damage to the patient.

But occasionally a case will crop up when it is found too much force would be required to bring them away by this means, and that it becomes evident the process is giving the cow pain, or the membranes may have been left too long and break away when traction is applied. Then other means must be adopted.

Most farmers will have noticed on the "afterbirth" of a cow a considerable number of red patches the so called *colyledons*. These are the points where the membranes are attached to similar patches in the womb of the cow, and it is to these *colyledons* that attention must be directed when manual interference is deemed necessary. The mode of procedure should be as follows:—grease the hand and arm you are going to work with, but before this, see that the finger-nails are short, so that there may be less likeli-

hood of scratching the inside of the womb; then pass the hand through the vulva, along the vagina, and through the mouth of the womb on the outside of the foetal membranes, feel for the points of attachment (cotyledons), take hold of each one which is still attached, and gently squeeze the whole mass, when it will be found to separate quite easily. When each point of attachment has been treated thus, the whole of the membranes can be removed. In those cases which have not been left longer than three days, no after-treatment is usually necessary, but where putrefaction has set in, and the womb is found to contain any evil smelling fluid, it should be thoroughly irrigated with some antiseptic solution, such as Jeyes' fluid, 1 to 100, or Perchloride of mercury, 1 to 1,000.

The best instrument to use for the above mentioned purpose is an enema

pump or an enema syringe. The nozzle should be oiled before use, and guided by the hand through the mouth of the womb. It is no use just placing the pipe in the vagina, as the solution would not reach the uterus. Should inflammation of the womb and blood-poisoning supervene, **further treatment will be necessary.** The symptoms would be rise of temperature, the animal shows signs of pain, frequent straining, and a discharge of coffee-coloured bad-smelling fluid through the vulva, ticked up appearance of the abdomen, blood-shot eyes, loss of appetite, and suppression of milk, and the lining of the vagina either dark red or purple in colour. Treatment should consist of frequent irrigation of the womb with antiseptics, combined with sedatives, and the internal administration of such drugs as sodium salicylate, or hyposulphite, potassium chlorate, etc.

Cape Fruit in London.

MESSRS. G. E. Hudson & Son, Suffolk House, Laurence Pountney Hill, Canon Street, London, E.C., have just issued their annual report showing the imports of Cape fruit into London during last season. From the extracts we give below both interesting and useful information may be culled.

The following are the imports of this year compared with the four previous ones:—

1899	10,817 bxs.	1901	17,268 bxs.
1900	17,336 bxs.	1902	14,998 bxs.
	1903	21,968 bxs.	

The particulars of the imports are as follows:—

	1902.	1903.
Grapes	5,896	9,043 boxes.
Plums	3,068	7,457 ..
Peaches	2,512	3,276 ..
Pears	746	705 ..
Apricots	110	32 ..
Nectarines	568	1,401 ..
Apples	29	22 ..
Quinces	25	29 ..

	1902.	1903.
Pines	23	— boxes
Naartjes	1,999	— ..
Oranges	11	— ..
Lemons	12	— ..
Pomegranates	—	3 ..

Looking into the above figures, it will be noticed that the number of boxes of Cape fruit received here during last season, show a considerable increase on the previous year, and comparing them with the 1900 and 1901 seasons, we find an increase of some seven thousand packages. This occurs principally in plums, grapes, and peaches. With regard to the first mentioned fruit, we think we are safe in saying the season has been a very satisfactory one, not only from a financial point of view, but in the progress made in bringing this fruit before the consumers, distributing, etc., and the increased demand for it. In this particular instance we have had a good, sound article to work upon and to put before the public, and there will, we hope, be a larger demand for plums next season; but as to grapes it

has been quite the other way about, and we feel sure the season has been unsatisfactory in every way to those concerned, owing to the condition in which they arrived. Moreover, Cape grapes have a bad reputation now, which will take some time to do away with. We shall deal more fully with the various causes of this unsatisfactory state of affairs under its proper heading. The demand for Cape fruit has increased considerably, and we have been able this season to put it into markets that should be great help to the trade in the future. New York has contributed to a very fair extent in this respect, and most of the Continental towns have had Cape fruit put before them this season, but as it has taken some ten or twelve years to get it known, or asked for to any appreciable extent here, we think it will necessarily take some time before other markets are able to take any quantity. Referring here particularly to plums, one thing in their favour is that we are able to keep them for a month or six weeks after their arrival, and this should be the means of extending the season very considerably on this side, and by utilising cool storage, we see every reason of being able to regulate the supply to be put on the London market. Previously we have not been able to do this for the simple reason we have not had stuff to do it with. We will now proceed to deal with the various fruits under their respective headings.

APRICOTS.

Only one shipment of this fruit arrived, making the small total of 32 cases only for the season. Our market could certainly have done with more than this quantity, but at the same time we cannot advise shippers to send this fruit over in anything like large quantities. Though usually arriving in good condition, it appears to lose a lot of its rich flavour on the voyage, and moreover, even at its best it is not a very popular fruit on this side. Still there is a limited sale for it, and for small quantities consisting of from thirty to sixty packages each week, extending over a period of, say, three or four weeks, would probably do well, but the package

we would suggest for it would be a small single layer box containing twenty to twenty-four good-sized apricots packed carefully and attractively in paper shavings, so, that if found necessary, it could be re-packed on this side. These small boxes could be crated together. We think it a pity that this fruit should be left almost entirely out, as it has been last season. With careful growing, packing, and attention, the trade might be increased, though we do not think it will be a large one.

PEACHES.

We now come to an important branch of the trade, a branch which, we are sorry to say, has not made anything like the progress it should do. The total number of cases received, 2,256, show an increase on last year's imports, but we can report hardly any improvement in any way; in fact the opinion is usually expressed that the Cape cannot grow peaches. This we know is not so. But the fact remains that the bulk of the fruit we have been in the habit of receiving is very inferior indeed, with one or two solitary exceptions. That excellent fruit, both in colour, size, and appearance, can be grown and sent over here we know is a certainty, for we have had examples of this in the fruit shipped by Mr. A. Nicholson and Mr. H. O. Arton, but out of the total number of cases received we are not far out when we say only the odd 275 boxes were really good fruit. We think it well to point out here at once that fruit that is saleable in Cape Colony is not necessarily so here. We believe the Burbank plum, for instance, is easily sold and appreciated in the Colony, but over here it will not sell, and is not liked. Another instance is the Satsuma plum, which, though liked and appreciated here, will not sell in New York, and we suggest that the sooner more attention is given to peaches in the same way that plums are being grown—as regards selecting the varieties that carry well and are of good appearance and colour, and last but not least, those that will retain their flavour—the better for this branch of the trade. We have seen hundreds of cases of

peaches that to all outward appearances were perfectly sound and eatable, but one had only to taste the fruit to find that its flavour had entirely gone, and they were absolutely useless, except, perhaps, for stewing. Mr. H. E. V. Pickstone, of the Rhodes Fruit Farms, will, we think, bear this out fully, as he had practical demonstrations of it at Covent Garden this last season. Another point we wish to bring forward especially is the shipping of what are called Semi-Clingstone peaches. Need we say these are not more popular on this side than Clingstones, and in the first place they do harm to the trade, and secondly they can not pay the shipper. Probably a small quantity arriving will sell by their appearance, which is usually good, but they are not bought a second time. There is a good demand for peaches over here during January, February, and March, and what is wanted is a white flesh peach with a good colour and regular in size and shape. On the whole they carry in very good condition, but more care in the handling and packing and selection of this fruit is, we are sure, needed. We can recommend no better method of packing than that which is in general use now. The package is a handy one, and liked by the trade. Care should be taken to send in hard condition, as it has often happened that some of the early arrivals are in better condition two or three weeks after those which have arrived in the meantime.

PLUMS.

For the last two seasons it has been most noticeable the improvement there has been in the production of this fruit, which has been the most successful branch of the trade, and we think we can honestly say that no finer fruit comes to this country than the Cape plum at present. Its size, appearance, and flavour leaves nothing to be desired. Added to which, many farms such as the Rhodes Fruit Farms, Limited, and the Meerlust Fruit Farms, have given all their attention to the best varieties for carrying and retaining their flavour. Amongst those we would mention Kelsey, Japan, Wickson, Satsuma, Coes, Golden Drop, and

Simoni. All those varieties seem to stand the voyage well, and arrive here with the bloom on them, and when fully ripe their flavour is excellent. Burbank plums, as we have previously stated, do not arrive here in good condition, and are not liked. We have been able this last season to experiment very much more largely with this fruit than we have hitherto been able to do, principally as regards their keeping qualities, and we have been able to put plums on sale a month and even longer after their arrival here, and this without having to resort to artificial storage, and when found necessary, we have no doubt that, provided they arrive in good sound condition, we shall be able to keep them for a considerably longer period, and so put them on to various markets as they are wanted. We consider it a favourable sign, and shows that the trade has taken very much to Cape plums, when we mention that for two or three weeks after the season had ended, fruiterers were inquiring from all parts of the country for Cape plums. As regards the style of package, we are still under the impression that the small, single layer box is the best one for sending this fruit over in. These packages enable buyers to inspect their fruit very much more easily, and to sort it for their own use. Crates a la California do not meet with the general approval of buyers on this side, and our experience has been that they do not carry fruit over here as well as the single layer boxes. We consider it absolutely necessary for shippers to exercise the greatest care and attention upon the sorting and sizing of their fruit. We have noticed the greatest difference this last season in this respect, and in the various marks, and in every case we have done our best to bring it before the notice of the actual shippers. It not only injures the individual mark, but it does a certain amount of harm to other good marks.

To enable plums to be stored here they must be shipped before they are quite ripe.

NECTARINES.

Taken on the whole, this fruit has arrived over in good condition, and there

has been a big increase in the quantities received last season. Nearly all that have been received are known as the Standwick Nectarine, and were shipped by the Cape Orchard Company, Limited, of Hex River, and this variety seems to stand the voyage very well, and retains its flavour. We are of opinion that there is still a lot of room for the cultivation of these, which, we think, would improve in shape and colour, and thus add to their value. They should be thinned out so as to get a larger fruit; the following varieties might be tried:—Lord Napier, Early Rivers, and Cardinal.

PEARS.

In this fruit there was a slight falling off last season in quantities exported, but on the whole, the condition has been satisfactory throughout. We have had a great many varieties over here this season, but those that have done best are, we think, the Louis Bonne Pears and the Beurre Rose. Kleffer Pears and Pitmarton Duchess are not appreciated; the latter, although fine in size, bruises very much in the carriage. There has been a steady demand for this fruit throughout. Other varieties that travel well and are liked are Beurre Capiernoul, Glow Moreau, and Doyenne de Comice.

QUINCES.

With only twenty-nine cases in all for the season, it is hardly possible to form an idea as to how this fruit would do in larger quantities, but with the small amount that has been here, there was a very ready sale for it. It was excellent fruit, and we could have done with rather more than we got. Mr. H. O. Arton, of Meerlust Fruit Farm, and the Cape Orchard Farm, Limited, were the two contributors. This fruit being mostly used with apples, and coming at a time, when these are scarce, we do not think there will ever be much demand for it.

APPLES.

Only twenty-two cases of these arrived during the season; they were shipped by the Cape Orchard Company, and were first class both in flavour, size and appear-

ance, and compared most favourably with any other fruit on the market.

COOL CHAMBERS.

We are of opinion that better ventilation is required than is at present given, and although most other fruits, such as plums, peaches, pears, etc., appear to carry well under present conditions, we are of the opinion that a current of fresh air through the chamber would tend to make grapes arrive in better condition.

It will be in the recollection of our readers that on this subject, we, in our reports of 1900 and 1901, drew attention to the deficiencies of these cool chambers. In 1902, finding no serious attention was paid to this by either shippers or owners, we were obliged to be content with things as they were, but this last season, which, in grapes especially, has been a very prolific one, providing fruit far superior in size, quality, and quantity, and with considerably more moisture or juice, the need for some more perfect system of carrying has become more apparent. For the very excellence of the grape has proved its ruin. Shipped in large quantities and carried in small cool chambers, the amount of moisture evolved from so large a mass has literally caused to rot in its own moisture, and has shown conclusively the want of ventilation in these chambers. At the same time shippers on your side have been able to send grapes to the neighbouring places and countries without the aid of cold chambers, but relying solely on constant ventilation, and occupying in the transit nearly as long a period as sending the fruit to England, and yet it has carried in very good condition, whilst the cold chambers have landed theirs in a half-rotten, sodden condition. We are glad to be able to add that Messrs. Dacey and Pickstone have brought these facts to the notice of Mr. Molteno, of the Union Castle Company, who has promised to see what can be done to remedy this state of things. As we know, and have already (in 1901) pointed out how it can be done, we have every hope that a better state of things in the carriage of this fruit will result, to the immense benefit of the shippers, who

have been heavy losers during this season, and, we may add, to the benefit of the shipping company themselves. We ask our correspondents specially not to let this matter drop.

CONTINENTAL MARKETS.

For the first time we have sent regular weekly shipments to New York, and a good few shipments to Paris, and other cities. As far as New York is concerned, we see every prospect of being able to do a good business there in Cape fruit, and the prices we have obtained are, on the whole, we think, satisfactory. It has been more experimental than anything else, and we have had to pay, naturally, for our experience in the way of charges, etc., but, when we come to do a regular and increasing business, we shall no doubt be able to minimise considerably; at present they are very high. Paris—our result from here has also been satisfactory, and we think this market would be useful to us in the future.

PACKING.

This throughout the season has been very satisfactory, and each year we consider shows a distinct improvement. We still think that no better size boxes can be substituted for those already in use—namely, the grape boxes, holding from 18 to 20 lbs. of fruit, peach boxes holding from 20 to 24 peaches, plum boxes holding from 26 to 30 plums, all single lever boxes, but we cannot impress too strongly upon shippers the necessity of taking the greatest care and pains possible with this particular branch of the trade. Neat and attractive packing goes a long way in selling this stuff at Covent Garden.

NORMAN SHIPMENTS.

This ship delivered some thirteen hundred cases of plums, all more or less in a distinctly rotten condition. In fact it was an isolated case of the failure of plums throughout the season. We dealt with the matter fully in our weekly reports of March 21 and 28, and in the latter report we urged the necessity of inquiries being made as to the cause of it, for that there was some special cause to

account for the bad condition we cannot doubt. The fact of the previous shipments, and later shipments arriving in such excellent condition, we consider all points to this idea. We on this side, are unable to account for it, and as mentioned in our report of March 28, 1903, from what we were able to learn, there was nothing to account for it in the cool chamber of the "Norman," which appeared to have worked satisfactorily. We consider a very full investigation should be made as to the cause of this failure. This lot arriving in bad condition did a lot of harm, as it gave buyers the impression that the plums were over ripe and getting finished.

CASES FOR PRIVATE PEOPLE.

We wish to bring this matter before the notice of Cape shippers, as there appears to be a good bit of misunderstanding, and false impressions are given as to the condition the fruit arrives in. Nine-tenths of these private cases pass through our hands, and we are able to speak authoritatively on the matter. The reports that reached the Cape from these private people as to the condition their fruit arrives in are very misleading, and commercially are not reliable. A person on this side receives a box, we will say, of Cape grapes from a friend at the Cape, and is duly advised of it arriving, and when that case is delivered, if the person to whom it is addressed gets as much as five or six pounds of eatable grapes out of the case, he is satisfied, and in nine cases out of ten does not complain to his friend on the other side. They have not got to pay for the grapes themselves, neither have they to market them, and they do not like to complain. Although they are satisfied, the actual case for commercial purposes is not worth more than half-a-crown or three shillings to the fruiterer. We have often been told by shippers that they have sent 30 or 40 cases to private people, and they had good reports of these cases, and yet the bulk of the consignment which was sold has done badly. We can only repeat that these private reports are in most cases not reliable.

CAPE FRUIT MARKET IN GENERAL.

We see no reason to alter our previous reports of this—namely, that there is a splendid market on this side at the time Cape Fruit arrives, especially for grapes if they can be got here in marketable condition. They are really wanted, but the fault hitherto has been that not one shipment after another can be depended upon. When one lot does arrive well and the trade takes to them, they naturally want some more, but the next shipment will arrive unsound, and fruiterers are practically hung up for grapes. Sooner than be placed in this position, they would rather be without Cape grapes at all, more especially as they have never been dependable. The only really sound

articles we have had to work upon has been plums. These can be sent almost anywhere and will keep; the consequence is, that trade is capable of and has been extended very considerably, simply because this is a sound marketable article.

In conclusion we would state that first of all we do not consider sufficient attention is given to the actual growing and cultivation of grapes and peaches for export. We mean as regards the right varieties to ship, those that carry well and that are saleable on this side. Secondly, we would impress the absolute necessity of supervision over the packing, grading, etc., of all fruits; and thirdly, the necessity of preventing the fruit from becoming over-heated in transport from the farms to the ship's cool chamber.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 45a.—Englishman. 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up

in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.

- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.
- No. 66a.—Australian of Scottish parentage, 38 years of age and has been in close touch with farming in Australia. Has had large experience of wattle growing.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of August, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same period from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	76.6	56.7	84.2	49.2	1.85	7	1.76	27th	3.01	4.17
Stanger... ..	78.6	52.9	98	49	2.03	14	1.32	26th	2.69	3.88
Verulam	76.6	54.5	90	46	1.20	6	1.05	26th	1.73	3.77
Greytown	78.2	49.1	83	42	1.58	4	.74	27th	1.58	1.84
Newcastle	71.0	43.5	76	36	.39	2	.23	27th	.59	.31
Ndwedwe	75.5	51.9	91	41	1.37	5	.98	27th	2.31	...
Estcourt	74.5	40.2	82	32	.80	1	.80	27th	1.40	1.60
Port Shepstone	82.8	53.4	91	48	3.79	2	2.20	26th	5.18	2.82
Umzinto	80.3	44.6	85	41	2.26	2	1.32	27th	3.18	3.75
Richmond	74.3	45.6	91	33	1.07	4	.67	26th	1.88	2.86
Maritzburg	76.2	46.5	92	38	1.00	4	.60	26th	1.34	2.50
Hilton Road	71.0	38.3	86	31	1.00	3	.57	27th	1.26	...
Howick... ..	75.1	40.4	86	32	1.33	5	.63	27th	1.66	1.97
Ladysmith	76.4	39.7	85	36	.84	2	.57	28th	.84	.92
Weenen	78.0	39.8	88	32	1.00	2	.75	27th	1.64	1.32
New Hanover	76.8	45.0	89	38	.92	4	.57	26th	1.56	2.50
Mapumulo	80.9	53.0	91	44	1.61	3	.95	26th	2.71	...
N'Kandhla	72.0	38.5	82	32	1.33	2	.80	28th	1.93	1.10
Qudeni	64.4	42.2	75	31	1.38	11	.68	28th	2.35	2.11
Hiabisa... ..	...	...	...	...	.37	1	.37	27th	.37	...
Melmoth	75.8	50.0	92	44	.94	4	.72	28th	1.63	1.19
Eshowe... ..	73.6	53.0	89	48	1.69	5	.69	27th	2.61	3.16
Point ... ..	...	...	...	...	2.44	5	1.92	26th	3.46	...
Lower Tugela	81.9	50.6	97	42	1.22	7	.40	27. 28	1.22	...
Mahlabatini	80.4	47.8	88	42	.50	2	.48	27th	.50	...
Ingwavuma	77.8	53.1	88	42	...	...	...	...	...	...
Nqutu	68.3	28.8	78	21	1.23	3	1.15	27th	2.15	1.07
Paulpietersburg	78.7	43.1	86	33	.25	2	.25	28th	.56	...
South Coast Junction ... ..	...	...	...	...	2.51	7	1.89	27th	3.40	4.47

Private Stations.

Central Experiment Farm (Manager)	86	31	1.00	3	.57	27th	1.26	...
Estcourt (James Lewis)	76	27	.81	3	.42	27th	1.38	1.72
Nottingham Road (C. J. King) ... ..	...	...	1.46	3	.74	26th	1.91	2.42
Adamshurst ... ..	...	...	1.09	3	.78	26th	1.33	2.08
Hilton (Henry V. Ellis)	88	34	1.33	3	.63	26th	1.78	2.54
P.M.B., Town Bush Valley (Wilkinson's Nursery) ... ..	...	...	1.04	3	.56	26th	1.71	...
Ixopo, Gorton (Chas. Green)	80	40	.63	3	.45	27th	.68	1.56
Mid Illovo, Ismont (A. N. Montgomery)	83	39	1.33	4	.94	27th	1.87	4.57
Mount Edgecombe (Natal Estates)	91	48	1.84	3	1.33	27th	2.49	4.13
Cornubia ... ..	...	...	1.98	...	...	...	2.78	4.40
Milkwood Kraal ... ..	...	...	1.02	...	...	...	1.27	3.34
Blackburn ... ..	...	...	1.47	...	...	...	2.24	4.10
Saccharine ... ..	...	...	1.49	...	...	...	1.99	4.19
Prospect Hall ... ..	...	...	1.27	...	...	...	2.66	3.89
Clairmont (J. R. Blamey) ... ..	...	...	2.35	2	1.43	27th	3.32	5.26
Equeefa (W. Hawksworth)	90	49	1.78	4	.86	27th	2.65	3.11
Umzinto, Beneva (E. W. Hawksworth) ... ..	...	...	1.93	2	1.08	27th	2.79	3.83

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	J. G. Hatting ...	Rama
		"	A. C. Harding ...	Meadow Bank
		"	H. J. Hatting ...	Kopliegte
		"	C. J. Labuscagne ...	Haasfontein
J. Button ..	Estcourt, South of Bushman's River	"	R. Wood ...	Willoford
		"	J. Haw ...	Woodleigh
		"	J. Lawrence ...	Grantleigh
		"	W. Fletcher ...	Erina
		"	H. Albrecht ...	Brynbella
		"	J. Marais, jun. ...	Northcote
		"	J. J. Marais ...	Malan Spruit
		"	C. P. Marais ...	"
J. J. Hodson ...	Lion's River ...	"	F. Symons ...	Glenbella
		"	W. Henderson ...	Hilton
		"	M. A. Sutton ...	Shaw's Flat
		"	Jos. Raw ...	Buffel's Bosch
		"	D. G. McKenzie ...	Lion's Bush
E. J. B. Hosking ...	Upper Umkomazi	"	R. J. Spiers ...	Owthorn
		"	J. W. T. Marwick ...	Mona Glen
		"	W. P. Gibson ...	Howard's Hill
		"	A. H. & R. H. Cockburn ...	Durslade
		"	Seyaga ...	"
K. Soutar ...	Portion of Lion's River	"	C. P. Lewis ...	The Hill
W. Wilson ...	Polela ...	"	A. Clouston ...	Northingham Town
R. Vause ...	Ixopo ...	"	C. A. Phipson ...	Lauds
L. Trenor ...	Alfred ...	"	J. Comrie ...	Strathcampbell
W. Gray ...	Upper Tugela, South of Tugela River, and Estcourt, North of Bushman's River ...	Lungsickness	W. H. Walton ...	Hepburn
		Scab	W. Gold ...	Greenvale
		"	Umpapu ...	Rockvale
		"	N. J. Vandermerwe ...	Location
		"	W. P. Gray ...	Gourton
		"	C. M. Pretorius ...	The Heff
A. H. Ball ...	Weenen ...	Lungsickness	J. van der Westhuysen ...	Strydpoort
		"	Seddon & Harris ...	Misgunst
		"	J. W. Harris ...	Weenen Commonage
		Scab	C. B. Leroux ...	New Settlement, Weenen
		"	L. J. Lotter ...	Waterfall
		"	J. P. Lotter ...	Waterfall
		"	J. J. Vermaak ...	Berg Vleit
		"	G. J. Vanderwesthuysen ...	Winterhoek
		"	C. J. van Rooyen ...	"
E. Varty ...	Umvoti, Western Portion	"	C. P. F. van Rooyen ...	Annadale
G. N. Perfect ...	Umvoti, Eastern Portion	"	G. T. Van Rooyen ...	Mona
C. J. van Rooyen...	Krantzkop ...	"	J. G. Nel ...	Pampoeneek
		"	W. H. Mayne ...	Elladale
		"	D. J. Martens ...	Mistley
		"	Nuss Bros. ...	Jammordal
R. J. Raw ...	Impeendhle ...	"	L. J. Nel ...	Salem
		"	S. Faber ...	Diepfontein
		"	E. Aliborough ...	Virginia
		"		New Forncett

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
R. J. Raw ...	Impendhle ...	Scab	Geshla ...	Impendhle Location
		"	Makekwana ...	
C. Swales ...	Umlazi ...	Lungsickness	H. Hill ...	Coquidale
		"	Cold Storage and Supply Co.	Richmond Farm, near Pinetown
		"	Native, Sam Fawkes	Assegai Kraal, near Betha's Hill
		"	John, & Mr. Kirk	Umlazi Location
		"	Miss Scott ...	Glenugi, New Germany
A. Hair ...	P.M. Burg City and Umgeni	Scab	E. Taylor and Umbabana	Zwartkop Location
E. G. Clerk ..	Newcastle ...	Lungsickness	Dundu ...	Styl Krantz
A. J. Marshall ...	Dundee ...	Scab	S. W. Reynolds ...	Newcastle T. Lands
		"	Sai M'Lief ...	Banff
		"	N. Glutz ...	Swiss Valley
		"	H. Thorn ...	New Port
		"	Willie Africa ...	Waschbank
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gunena ...	"
		"	J. H. Hatting ...	Hattingsvale
		"	P. H. Marshall ...	Cleveland
		"	D. Meumann ...	Hazeldean
		"	J. A. Landman ...	Boschfontein
C. E. Walker ...	Umsinga ...	Lungsickness	Umtagati ...	Mhlezunga
		"	Mbitgi ...	Craigneathen
		"	J. S. Vanderwesthuysen ...	Pomeroy T. Lands
		"	Mahakana ...	Jobsdale
		"	W. H. Boshoff ...	Pomeroy T. Lands
		Scab	Habelela ...	Jobsdale
		"	Mflatela ...	Mazaliego
		"	Umsbakoma Qutu	Vermaak's Kraal
		"	C. J. de Villiers ...	Vermaak
		"	Umgota Mbata ...	Mumbe
		"	P. R. N. Vermaak	Balgownie
		"	S. J. Vanderwesthuysen	Pomeroy
J. Chaplin ...	Klip River ...	Lungsickness	Gepo ...	Arcadia
		Scab	W. Wright ...	Colworth
		"	S. Schoeman ...	Maritz Drift
		"	P. Nicholson ...	Hobsland
		"	W. Leathern ...	Clydesdale
		"	H. W. Boers ...	Alexandra
		"	Mrs. M. K. du Plessis	Maggiesdale
		"	J. C. Buys ...	Reit Kuil
		"	P. K. Dalebont ...	Maggiesdale
		"	J. L. Marais ...	Meyer's Hoek
		"	D. P. Conradi ...	"
		"	A. J. Marais ...	Waterfall
		"	Stomoko ...	Blauwbank
		"	J. Stomoko ...	Reit Kuil
		"	Botchu Luchaba ...	"
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	W. O. Coventry ...	Goodoo
R. Wingfield-Stratford	Utrecht ...	"	S. Sharratt ...	Klein Waterfall
		"	J. Voss, sen. ...	Charlestown
		"	H. Beukes ...	Roodekop
		Lungsickness	H. Beukes ...	"
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata ...	"
		"	Umfumwa & Dehla	Waterval
		"	F. Oombrink ...	Bankroet
		"	Kumandi ...	Hlobane
		"	T. Pretorius ...	Sterkspruit
		"	L. Botha ...	Waterval
		"	Ndotyane ...	Rustplaats

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
G. Daniell ...	Vryheid ...	Scab	Hawse ..	Kromellenbourg
		"	J. R. Steenkamp...	Rustplaats
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Umkonyana ...	Welverdient
		"	G. van der West-	Vaalkopjes
		"	huizen ...	
C. T. Vaughan ...	Paulpietersburg ...	"	Stumpf ...	P.P.Burg T. Lands
		"	Natives ...	Jachtbaan
		"	Ndanuse ...	Uitval
		Scab	J. Vanden Heever	"
			E. Klopper ...	Wachteenbeetje Spruit

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni				
Districts ...	...	...	1 for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	...	1	"
" North of White Umfolosi and Umfolosi Rivers	...	...	—	—
Total	...	2		0

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkaudhla, Entonjaneni, and Ndwandwe Districts.
Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 16th September, 1903.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of August, 1903:—

Name of Colliery.	Labour Employed.						Unproductive Work.			Coal raised. tons. cwt.
	Above Ground.			Below Ground.			E.	N.	I.	
Natal Navigation	24	136	145	17	346	80	7	16	0	13,733 2
Dundee Coal...	13	14	175	16	154	311	2	39	27	11,539 7
Elands Laagte	11	20	193	12	180	260	...	...	...	11,040 9
St. George's ...	14	62	91	8	240	86	1	9	...	8,436 0
Glencoe ...	15	108	81	11	279	19	...	16	...	7,224 0
Natal Steam Coal	2	63	6	4	280	4	...	...	...	4,487 15
No. 42 ...	4	15	17	3	100	2	...	...	...	1,788 13
Newcastle ...	3	12	13	4	109	3	4	30	...	1,781 6
Central ...	1	45	6	2	114	5	2	2	1	1,595 11
W. Lennoxton	1	10	15	3	35	25	...	...	...	1,532 11
Ramsay ...	3	15	14	3	50	47	2	16	...	1,303 19
Natal Merthyr	2	20	3	2	115	3	2	6	1	1,260 0
Crown ...	2	13	35	2	34	4	...	...	...	839 0
South African	2	21	2	1	22	2	18	113	8	238 0
Hlobane ...	...	1	...	1	14	...	...	1	...	227 9
Vrede ...	1	4	...	...	...	...	...	...	...	26 0
Total ...	98	559	796	89	2,072	851	38	248	37	67,053 2
Corresponding month, '02	129	466	710	109	1,576	1,119	15	82	155	52,660 18

Dundee Coal Coy.—No. of natives above ground (July) should be 14, instead of 172.

CHAS. J. GRAY,
Commissioner of Mines.

9th September, 1903.

Return of Coal bunkered and exported at the Port of Durban for the month of August, 1903 :—

					tons.	cwts.
Bunker Coal	...	...	...	..	27,019	16
Exported to :—						
Beira	...	...	...	..	20	10
Total...	...	...	...		27,040	6

* All Colonial Coal.

Customs House, Port Natal,
August 31st, 1903.

(Signed) W. L. HOWE,
for Collector of Customs.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of August, 1903.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Aug. 1	Potatoes	300 cases	Las Palmas	Bantu	Free of Pest.
" 3	Fruit Trees	16 bales	Albany	Aberdeen	Fumigated.
" "	Apples	560 cases	"	"	Free of Pest.
" 7	Palms	1 Warden case	"	"	"
" "	Fruit Trees	1 case	"	"	Fumigated.
" "	Geraniums	1 "	Cape Town	Saxon	Free of Pest.
" "	Fruit Trees	3 bales	"	"	"
" "	" " " " " "	1 bale	"	"	"
" "	Orange Trees	1 case	Albany	Aberdeen	Scale present.
" "	Potatoes	653 cases	Las Palmas	Umsinga	Fumigated.
" "	Fruit Trees	1 case	Albany	Wilcannia	Free of Pest.
" "	" " " " " "	1 bale	"	"	Fumigated.
" "	Potatoes	1,191 bags	"	"	Free of Pest.
" "	Apples	968 boxes	"	"	"
" "	Lemons	75 "	"	"	"
" 12	Peach Trees	1 bale	Cape Town	Dunvegan Castle	"
" "	Fruit and Fir Trees ...	2 bales	"	"	"
" "	Potatoes	150 cases	Delagoa Bay	Safari	"
" 14	Seed Potatoes	2,150 "	London	Umvolosi	"
" 18	Apples	90 "	Madeira	Scot	Codling moth present. Shipped to Delagoa Bay. Transv'l notified.
" "	Grape Vines (24)	1 bale	Cape Colony	"	Detained.
" "	Fruit Trees	10 bales	"	"	Free of Pest.
" 19	" " " " " "	10 bundles	"	"	"
" "	Ferns	3 cases	"	"	"
" "	Seed Potatoes	500 "	Bordeaux	Glan McNeil	"
" 22	Fruit Trees	1 bale	Albany	Damascus	Fumigated.
" "	Potatoes	701 cases	London	Inkonka	Free of Pest.
" "	" " " " " "	200 "	Naples	Herzog	"
" 25	" " " " " "	173 "	Albany	Coveyanna	"
" "	Apples	50 "	Madeira	Norman	Codling moth present. Shipped to Delagoa Bay. Transv'l advised.
" "	Potatoes	1,008 "	Melbourne	Darnis	Free of Pest.
" 27	" " " " " "	1,866 "	Sydney	Morayshire	"
" "	Apples	10 "	"	"	"
" 31	Seed Potatoes	850 "	London	Inchanga	"

Custom House, Durban, 4th September, 1903.

C. B. JONES, Examining Officer.

District Reports.

WEENEN, 5th September.—The temperature has been normal. A few small garden plots of French beans have been nipped by frost, otherwise the huge crops of Cape and Algerian forage look well, there are no indications of rust. I am afraid that unless reaping machines are introduced, Native hands for day work with the sickle will be in a position to demand and receive their own pay, as was the case last season, and this was before the new blocks were cultivated, when hands got as much as 2s. 6d. a day. Then, again, in regard to agriculture here, we have no railway to utilize to get produce to markets, and the few possessors of full teams of oxen and wagons will, when this season's crops are reaped, be happy. Those people, few in number like the Native reapers, will be able to fix their own rates of transport. Weenen should receive immediate consideration, and be given a branch line connecting at the nearest point with the main line, but this point of connection is not directly the question, so long, I may say, as Weenen gets a connection, and soon. The question might be asked by some non-residents, why should Weenen receive immediate connection by rail in preference to any of the other places already prepared to be connected; to this, I say, without fear of contradiction, large sums of money have been spent by the Government on irrigation works here, blocks of land have been laid out, surveyed and sold to the public at high prices, the buyers are charged a high water-rate per acre, huge crops are produced on this land, and there are no means of getting them to market, and I must say that most, if not all the buyers were under the impression that the building of a branch line to Weenen would be commenced shortly after the sale of the raw blocks. However, the public here have implicit trust the Government will give them a line with as little delay as possible. In June last I visited and inspected the Native fields under irrigation at the Tugela in company with Mr. James Peniston, the manager at that time. Hundreds of plots of land, from a quarter of an acre to two acres, had recently been sown with peas and wheat; about ten days ago I again inspected these fields, or at least some of them, and found all crops alike, thriving exceptionally well, the peas are in full blossom, the wheat although good, was sown a little late, I think. Some mealies are already three or four inches high, these will be reaped in December, when a second crop will be put in of the same kind. Mr. Peniston takes great pride in his work, which is abundant, and I must say it is well done. There are no complaints by the Native field owners, and this speaks volumes for Mr. Peniston's task. Stock is beginning to "pick up" condition again. Lung-sickness has, without doubt, now broken out on the new Weenen blocks, this will be a great drawback, especially if it continues when the forage crop has to be taken to market.

R. ERNEST DUNN, Magistrate.

EMPANDHLENI, 31st August, 1903.—The weather has been cold, with occasional very strong unpleasant winds. The first thunderstorm, accompanied by a good rain, passed over the Division on the 27th instant. The pasturage in the neighbourhood is still very bad. The maximum temperature was 82 degrees, the minimum 32 degrees, and the total rain-fall 1.33 inches. The demand for grain still continues, and a large trade is being done in goats by the traders. The price for mealies still ranges from 30s. to 40s. per muid. Since the rain on the 27th instant all the Natives have begun to hoe, and I am told that the mealies in the low part of the Division are well out of the ground; it is to be sincerely hoped that good weather will continue. No locusts have been reported. The Division still remains free from lung-sickness. Mange is still bad in the Division, and it is difficult to get the Natives to properly cope with the disease, more especially with the young horses. Rinderpest, I am glad to say, is at last on the decrease; with the exception of the wards of the Chiefs Hashi, Ndube and Sitshitshilo, the Division is clean. Mr. T. W. Cooper, Inoculator, has every hope of having the disease quite out in the course of another month or so. The approximate number of deaths from rinderpest was 58 head. The granting of permits for the introduction of cattle from Vryheid Division is much to be deprecated.* With the exceptions of bad colds, the health of the Division has been good.

C. C. FOXON, Magistrate.

[* The granting of permits for cattle coming from Vryheid to any other part of Natal is not necessary since the restrictions on the Tugela River above its junction with the Buffalo were removed. Zululand is at present the only part of the Colony from which cattle cannot be removed or taken into.—*Ed. Agricultural Journal.*]

LOWER UMFOLOZI, 4th September.—During August the weather was very dry. Rain only fell on six occasions, viz: the 8th, 18th, 25th, 26th, 27th and 31st. The heaviest fall occurred on the evening of the 27th; but owing to the high winds which almost incessantly blow in these parts, with little, if any beneficial result. On the 17th and 31st perfect gales were experienced; and, on the 18th, a terrific hurricane. Fortunately, however, no casualties resulted from the latter, so far as is known. Crops seen during a train and trolley trip to and from the Umfolozi, on the 14th and 15th, looked exceedingly well, though only a few inches high; and, provided the locusts—which were greatly in evidence during the month—are kept from them, should yield a fair harvest in due course to the industrious planters. Large swarms of locusts passed over the Magistracy on the 10th, 17th and 29th, E. to W., S. to N., and N.E. to S.W. respectively; and an enormous swarm, extending from Umlalazi to Hlabisa Division—right across this Division—a

distance of, roughly, forty miles—passed from S. to N. in one long, continuous flight, between the railway and the coast. Stock did fairly well judging from reports received and personal observation of the condition of several Native herds about the Division, and of transport oxen employed by hundreds between Hlabisa and Ntonjaneni Divisions and this. Only five deaths among stock were reported, and two suspected cases of rinderpest were reported in Chief Masujana's location: but later it was stated the cattle had recovered. Influenza colds were rife. Owing to recent drought the Umfolozi mouth is reported closed to the sea.

A. R. R. TURNBULL, Magistrate.

BULWER, 12th September.—There is little or nothing to report from here. The last fortnight the usual climatic changes of spring time have been prevalent. Trees are now in full blossom in the elevated portions of the district, in the lower and warmer parts the fruit is now fully formed. The grass from the Drakensberg to Bulwer is now fairly good for all kinds of stock, but rain is wanted badly to keep it going. A nice rain fell ten days ago, but the hot winds have dried up all the moisture. Just now we are getting dull, cold weather, which is not even accompanied by heavy mists: an unusual thing for this time of the year up this part. The wheat crops and the early forage crops are looking well, I am glad to say, in spite of the shortfall of rain. Potato planting is in full swing, an extensive acreage is being cultivated this year. This is not confined to the Europeans alone, but the Native land owners also are now planting both wheat and potatoes largely

in the Polela River District. Very little mealie planting has been done yet. As regards stock I have only heard of one death from Gallsickness, and there have been several cases. The district is free from Lungsickness or any other disease as far as I know—as regards cattle. Mange, I am sorry to say, is still bad among the horses in many parts of the Division, causing many deaths. I have not been able to ascertain yet how the lambing is going on, but will be able to report thereon in my next notes. There was a Stock Sale held at Bulwer on the 14th ultimo, but there were very few buyers, and most of the stock was not sold. The ruling price for cows was from £15 to £16, and £14 for heifers, and yearlings £9 9s. per head. Mealies are selling at 25s. per muid retail, and 20s. to 24s. wholesale.

H. W. BOAST, Magistrate.

NEWCASTLE, 12th September.—Beyond the weather, there is nothing worthy of note. A promise of early spring has been marred by late frosts, followed by hot winds, and I fear that the coming fruit crop is, on the higher levels, seriously damaged. We have not participated in the rains mentioned in "Passing Notes" in your last *Journal*, beyond a couple of light showers, and water springs are running low. I am a firm believer in the 12 years Rain Cycles, but, based on my observations of the seasons from 1856, I say that we have no reason to look for a wet season sooner than 1904 or 1905. Nature may vary but she never errs. The lambing has been, so far as I know, a fairly good one, and, up to the present, there has been grass sufficient for the ewes.

J. O. JACKSON, Magistrate

Market Reports.

Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

One pleasing feature worthy of being recorded is the fact that Maritzburg and its neighbourhood during the past seven days has been visited with two thunderstorms. The rain was not heavy, but it indicates that there is a possibility of an early spring. To the Colony at large an early spring would be heartily welcome, and might prove an important factor in stimulating trade. Unfortunately one hears the same complaints which have now become quite familiar, viz., that there is next to no prospect of trade booming. From telegraphic information the crops in the British Isles are beyond salvation, but the American corn crop is stated to have "surpassed expectations," and that it exceeds, according to estimate, the crop of last year by the trifle of some 2,287,594,300 quarters. Under the circum-

stances, unless the sea dries up, we need not fear starvation during the next season.

Mealies.—We are now absolutely dependent on American mealies, both north and south; the former being from 14s. to 16s. in Durban, and the latter about 12s., duty paid.

Forage.—Some very fair samples are now being offered at prices varying between 7s. 3d. and 10s. 6d. per 100 lbs.

Hay.—Prices are almost everything according to quality; and while some samples have only realised from 1s. to 1s. 4d., and 2s., better samples have been eagerly purchased at 2s. 3d., 2s. 6d., 3s. 6d., and up to 4s. 8d. per 100 lbs. Bedding, from 4s. 3d. to 17s. 6d. per load.

Potatoes.—From 8s. 3d. to 18s. 3d. per 100 lbs.; sweet potatoes, from 4s. to 8s. 9d. per sack.

Pumpkins.—A few are still coming forward, and prices have been about 18s. per dozen.

Green Barley.—From 2s. 3d. to 3s. 1d. per 100 lbs.

Millet.—About 7s. per 100 lbs

Mabele.—Very little but Indian mabele is now being used.

Melons.—From 1s. 3d. per dozen.

Onions.—From 9s. 6d. to 22s. per 100 lbs.

Beans.—From 20s. 6d. to 25s. 6d. per 100 lbs.

Peas.—From 12s. 6d. to 19s. 6d. per 100 lbs.

Tobacco.—From 4d. per lb.

Butter.—The market is fairly well supplied for the time of the year, and prices fluctuate between 1s. and 2s. 3d. per lb.

Eggs.—Are now more plentiful than they have been for some time past, and prices have ruled between 1s. 3d. and 2s. 8d. per dozen.

Poultry.—Common fowls, from 2s. to 5s. each; ducks, 4s. 3d. to 10s. 3d. per pair; guinea fowls, from 7s. to 8s. per brace.

Vegetables.—Beans, beetroot, cabbage, carrots, cauliflowers, celery, eschalots, lettuce, leeks, parsley, onions, peas, radishes, tomatoes, turnips and parsnips.

Fruit.—Bananas, grenadillas, loquats, naartjes, oranges, papaws, and pineapples.

Sundries.—Beef, 5d. to 6d. per lb.; mutton, 8½d. to 10d. per lb.; pork, from 3½d. to 8d. per lb.; bacon, 4d. to 9½d. per lb.; pigeons, 1s. 9d. to 2s. 3d. each; rabbits, 3s. each.

Firewood.—From 5d. to 10d. per 100 lbs.; cut firewood, 10½d. to 11½d. per 100 lbs.

JOHANNESBURG—Mr. W. H. Thomas, Box 1,960, writes:—

Since my last report the market has not undergone much of a change. Prices remain about the same for all produce excepting oat hay, which is slightly better. The ruling prices are:—

Barley per 163lbs.—Very little has been offered for sale, and prices are about the same as last week, 15s. to 16s.

Barley (Green) for forage per 100 bundles.—Prices for this has come down, as such a lot has been offered lately, selling from 15s. to 25s.

Bran, per 100lb. bag.—Only South American importation is being offered. No Colonial bran has been offered on the market lately. Prices 8s. to 8s. 6d. per bag.

Bales of chaff per 100lbs.—Of this a fair quantity has been sold, but not of very good quality.

Chaff—Prices from 8s. to 9s. per 100lbs.

Mabele per 203lbs.—No South African grown mabele comes to the market, only Bombay, realising for whites, 17s. to 18s.; reds, 22s. to 22s. 6d.

Manna Hay per 100lbs.—Some of very indifferent quality has been offered, realising 7s. to 8s.

Natal Hay per bale.—Any amount now coming on the market, and realising 2s. to 2s. 6d. per bale.

Forage, "Oat Hay" per 100lbs.—Large parcels are still coming forward, but good forage still commands fair prices, 8s. to 9s.; best, 11s. to 11s. 6d. per 100lbs.

Mealies per 203lbs.—Some South African grown were offered, and realised from 21s. to 22s. 6d. per bag, but of indifferent quality. Mostly imported mealies are selling now, from 7s. 9d. to 18s. 9d.

Onions per 123lbs.—This has improved considerably. Prices being to-day for best Colonial dry, at 26s. to 28s. per bag.

Potatoes per 163lbs.—The market continues to be well supplied in this line, and good potatoes still realise fair prices, 26s. to 28s.; medium, 22s. to 24s.; and others up to 20s.

Eggs (local) Fresh. 3s. to 3s. 6d.; imported Colonial, 1s. 6d. to 2s.; imported overseas, 1s. to 1s. 3d. per dozen.

Poultry—Ducks, 8s. to 9s. each; fowls, 3s. to 4s. 6d.; geese, 9s. to 11s.; turkeys (hens), 10s. to 12s.; turkeys (cocks), 18s. to 22s.

Cattle—Slaughter oxen, £22 10s. to £25; trek oxen, £15 to £20; milch cows, £25 to £30; ordinary cows, £12 to £15; tollies, £10 to £12 10s.; heifers, £12 to £15; goats and sheep for slaughtering, 30s. to 32s. 6d.; ordinary, 20s. to 22s. 6d.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is still in the most depressed condition imaginable, and the outlook is equally so.

Mealies.—The market is rather firmer, especially for good qualities. South American bring 11s., and North American 12s. per maid in bond. There are, however, large quantities of both, which are inferior, and are sold at fully 1s. less or more.

Potatoes.—Best early rose, or other good Colonial samples, run from 17s. 6d. to 25s. per bag. The market is still well supplied with importations at all prices, and only fancy qualities bring the higher rates.

Hay is in small demand, and very large parcels are on offer at the morning market.

Forage.—This is in good supply, at about 10s. 6d. per 100 lbs.

Other lines in good supply, and quotations generally in the buyer's favour.

An interesting address was given by Sir James Crichton Browne, the president of the Sanitary Inspectors' Association, assembled last week at Middlesbrough. Sir James referred to the role played by flies in the propagation of disease. Leaving aside the researches concerning the part played by the *Anopheles* in malarial infection, he confined his attention to the common house-fly. "This most fearless and audacious of all creatures" is probably the carrier of many varieties of bacterial infection. It appears that cultures of many pathogenic organisms have been obtained recently from the excreta of the common house-fly, *Musca domestica*. The role played by these insects in the dissemination of enteric fever in South Africa was referred to, and Sir James remarked that one of the collateral advantages of our campaign in South Africa might prove to be the opening of our eyes to the part played by flies as disease-mongers. The enormous fertility of the ordinary fly forms one of the chief obstacles to its extermination; it has been calculated that one female fly may have 25,000,000 descendants during one season, (*Nature*, August 21 1902).

Stock Diseases Proclamations in force.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos. 38, of 1894; 1, of 1896; 34, of 1896; and 3, of 1897; or of any Act to be construed therewith, or of any Proclamation which may be issued thereunder.

PROCLAMATION No. 43, 1900.

Principal Veterinary Surgeon, under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION No. 54, 1894.

Importation of dogs into Natal prohibited except under certain conditions.

PROCLAMATION No. 8, 1901.

Regulations under Lung sickness Act. Cattle allowed to leave an infected area upon written permission from Principal Veterinary Surgeon.

PROCLAMATION No. 59, 1901.

Cattle from Basutoland prohibited from entering Natal.

PROCLAMATION No. 29, 1901, and 52, 1902

Zululand declared an infected area. No cattle allowed to leave or enter that Province.

PROCLAMATION No. 46, 1903.

Cattle allowed to enter Zululand upon permit from Principal Veterinary Surgeon.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district allowed to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 98, 1901.

Cattle from Transvaal prohibited from entering Natal.

GOVERNMENT NOTICE No. 506, 1901.

Any part or parts or any material prepared with or from animals affected with or having died from Rinderpest may not be introduced into Natal nor be removed from one place in Colony to another, except under written authority from Principal Veterinary Surgeon.

PROCLAMTION No. 36, 1902.

Importation of cattle prohibited from following countries:—The Colony of Rhodesia; the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana, in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36, 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston, inclusive.

PROCLAMATION No. 71, 1902.

Importation of cattle prohibited from all States of the Australian Commonwealth.

PROCLAMATION No. 15, 1903.

Cattle from East Coast of Africa prohibited from being imported into Natal.

PROCLAMATION No. 25, 1903.

Certain areas—Zululand and districts of Vryheid and Paulpietersburg declared infected areas on account of Rinderpest.

PROCLAMATION No. 63, 1903.

Importation into Natal of cattle, sheep, goats and pigs from Argentine prohibited.

PROCLAMATION No. 77, 1903.

Importation into Natal of horses, mules and cattle from Mauritius and India prohibited. Under certain conditions animals from India may be imported into Natal.

PROCLAMATION No. 79, 1903.

Portion of Ingwavuma district, Zululand, declared an infected area.

Weekly Rinderpest Report up to 15th September, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths to date from the 26th May, 1903
<i>Zululand.</i>			
Eshowe District	10	8	231
Umlalazi District	5	9	119
Nkandhla District	9	11	266
Mahlabatini District	12	20	72
Ndwandwe District ... ..	...	3	89
Entonjaneni District	3	...	6
<i>Vryheid District.</i>	23	40	128

M. J. HIME,
15th September, 1903, for P. V. SURGEON.

The Agricultural Journal

AND MINING RECORD.

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C. O. D.

WE note with much satisfaction that the Government has consented to give effect to the Resolution of the Farmers' Conference with regard to C. O. D.—the system of collecting cash on the delivery of small railway consignments. It will probably be some time before the system "catches on," because both buyers and sellers will have to be educated up to it. When once it becomes generally understood there can be no doubt that its popularity will be great. A producer has eggs, kitchen garden stuff, flowers, fruit, poultry, meat or what not to dispose of. He advertises, and the orders he gets he sup-

plies, and there his work ends. He has no writing of a note to his customer, he need have no doubts about the customer's capability to pay, he need make out no account and possibly intimations "to account rendered," and still further correspondence. The railway relieves him of all this trouble and possible worry. The railway acts with full powers as his agent for a trifling percentage.

The attractions for the customer, so far as relief from correspondence, sending of P.O. orders, etc., are similar, and he gets what he wants, direct and fresh, without the intervention of a middleman. The writing on a post card of a dozen

words is all the pen work required of a buyer.

Farmers who give fair value for what they sell in this way will quickly get a good reputation; those who do not deal fairly will also quickly get a reputation, but a bad one.

The C. O. D. system will prove of service both to farmers on a big scale and to farmers on a small scale. It will win the appreciation of the former because of its simplicity and on account of the absence of the personal element. The big farmer accustomed to transactions bringing in cheques of two and three figures dislikes, as a rule, petty deals. But if petty deals can be done without the personal trouble of correspondence, and the sending of small accounts can be done with practically no more trouble than in selling goods by auction, he will not object to them. Small farmers, the class of men public speakers are always saying the Colony stands most in need of, will

find the system to give them much that they want, namely, a safe and easy way of doing a quick cash business. Of course the system is reciprocal. The storekeeper can send his goods C. O. D. to country customers, but to him the system will, of course, be of less service. Country customers, almost without exception, pay their tradesmen's accounts, and the sending of notes and invoices is altogether part of a tradesman's daily business.

In conclusion, we may add that the adoption of the C. O. D. system on the railway is not without gratification for ourselves. In the earliest issues of the *Journal* we advocated the system, and since then we have never allowed the subject to drop out of sight. For bringing the produce of the field to the consumer, the system is an ideal one, and there can be no doubt that the success which has followed its adoption in America and elsewhere will in due time be realised also in Natal.

Passing Notes.

SULTANIEH GRAPES.—Those who grow grapes successfully might do well to give a trial to the Sultanieh grape, or Sultomah, as spelt in Hogg's "Fruit Manual." The Sultanieh, from which the well known Sultana raisins are produced, is delicious in flavour, slightly sugary, and would be grateful to those to whom highly flavoured grapes are distasteful. The great attraction, however, would probably lie in the fact that the Sultanieh is seedless, and grape seeds, as has lately become generally known, are apt to produce the dreaded disease appendicitis. The rich people of Johannesburg and the other wealthy towns of South Africa would probably not hesitate to pay long prices for grapes in the eating of which there would be no danger lurking.

SHOWYARD VETTING.—There are few in England who will deny the benefits which have followed the adoption of the system of submitting stock for exhibition at shows to veterinary inspection.

Animals with hereditary defects which might escape the notice of the Judges, have had but the poorest chances, however great their general attractiveness, of scoring in the prize lists. But at the great British show, the R.A.S.E., four vets, Messrs. Bowen, Malcolm, Parker, and Hobday, seem to have made a mistake that the opponents of veterinary inspection at shows will make much of. They signed a joint certificate that a filly of Sir J. Blundell Maple was, in their opinion, affected with sidebones. Sir Blundell Maple, the wealthy furniture dealer and enterprising stock breeder, did not share this view, and had the animal examined separately by five eminent men in the veterinary profession. The results he has published, and he points out how severely the damaging certificate would have affected a poor farmer. Mr. Waugh examined the filly and certifies that she is free from all hereditary disease. Mr. J. Fraser, F.R.C.V.S.

examined her on the following day, and certifies that she is, in his judgment, free from hereditary disease. Mr. George Elmer, another F.R.C.V.S., examined her, and certifies that she is free from all hereditary disease. Professor Wortley Axe examined her, and is of opinion that she is free from hereditary disease. Mr. H. F. Reynolds certifies an examination, and opinion that the filly is free from hereditary disease. When doctors disagree, it is, as a rule, profitless to offer an opinion, but in the present case where five top men give separate opinions which prove adverse to the collective opinion of four who are, comparatively, on the lower rungs of the professional ladder, the layman will side with the former. Although this presumable error will prove mischievous to some degree, yet the principle of veterinary inspection for shows in England is much too well established now-a-days to be shaken by it.

GREEN SORGHUM POISONOUS.—Not much green sorghum is fed to stock in this country. Mr. Teasdale, of Lidgeton, made trial of it last year for ensilage, but from what he said, which was related in the *Journal*, No. 10, Vol. VI., he was not likely to repeat the experiment. In various parts of the world, and particularly in the United States of America, sorghum is largely fed to horned stock, and occasionally with fatal results. The sorghum was never suspected of possessing evil properties, and the fatalities were always put down to other causes. Dr. A. T. Peters, of the Nebraska Experiment Station, suspected the sorghum some three years ago, and since his first suspicions, he has made a series of investigations, which show that prussic acid is a normal constituent of all Nebraska sorghum, including Kafir corn. The report he will furnish, it is stated, will give evidence on which the following conclusions are based:—“Young plants contain a larger quantity of combined prussic acid than more mature plants; second growth is not more dangerous than first growth; frost does not increase the amount of poison; drouth, by resisting development, tends to cause the plants to become highly

dangerous; the danger increases as one goes Westward from the Missouri River (and this fact cannot be explained by lack of rainfall alone); reasons are given for believing that thoroughly-cured sorghum is harmless.” We do not know of any farmers in the Colony who feed green sorghum to their stock, but if there are any they would do well to wait for Dr. Peters’ report in full, or have their local sorghum carefully analysed. Of course it is possible that green sorghum in Natal may be free from prussic acid, and again it is possible that Dr. Peters may be wrong in his analysis and conclusions; still it is always well to keep on the safe side.

OUR ILLUSTRATIONS.—The picture of a Kafir mowing is a familiar subject to South Africans; to our foreign readers it will be a novelty. The picture of draught oxen in England is taken from the delightful publication *Animal Life*. Mr. T. A. G. Strickland, F.E.S., who writes the description, is more literary than matter-of-fact, and we find but little in what he says that would prove of general interest for these columns. The oxen photographed were working in Sussex. A voorlooper boy will be seen, holding one of the front oxen by the head, but in another of the illustrations in *Animal Life* the oxen are seen turning, as they do here, of their own accord, and the boy is engaged driving the near after ox so as to get on the headland in a straight line. The harness, it will be noticed, is similar in most respects to that of horses. In a recent issue, the Editor of the *Journal*, writing personally in reply to a correspondent, said that he had years ago successfully used for ox harness an old horse collar put on upside down. In the illustration it will be seen that the collars are put on just as they would be put on horses. The bridles with blinkers, and the short whip, are among the other striking features of the illustration.

RINDERPEST ACT.—The Parliamentary Bill, which we published in the last issue, was gazetted on the 15th ulto., and may be, therefore, now referred to as the Law on the subject.

Factory Accounts.

MR. S. RICHARDSON, Manager of an Australian Co-Operative Factory, writes in the *Station, Farm, and Dairy*:—

Bookkeeping is the art of recording business transactions in a regular and systematic manner, thus enabling a person to know the state of his business by an inspection of his books, or it might be said an application of common sense to money records. As to the method adopted, a good deal depends on the nature of the transactions to be recorded, but whatever they may be there are certain well-defined and scientific principles laid down for our guidance, but it would hardly come within the scope of this paper to go into this matter. In keeping factory accounts, or any accounts, the more simple and concise the method adopted the better; it, therefore, behoves those in charge of this branch of the business to look round and adopt the most up-to-date method suitable to the circumstances.

Now the question arises what books are necessary to record in a plain and simple manner all the transactions which occur in a butter factory. In as short a manner as possible I will describe a set of books kept in the office of my company, and which suits the transactions very well.

For the purposes of this paper I have divided the books into two classes, viz., statistical and financial. In the statistical may be found the number of lbs. of milk or cream brought to the factory by each supplier, the amount of butter made therefrom, and will also show what has been done with that butter. The financial deals with the monetary part of the business.

In the first place I will deal with the statistical, which are as follows:—

1. Rough receiving books—one for milk and one for cream.
2. Daily return of milk and cream books,

3. Daily sales book.

4. Stock book.

5. Abstract suppliers' ledger accounts.

If cream only is received at the factory, one each of No. 1 and 2 is all that is required.

First, the rough receiving books in which the number of pounds of milk or cream brought to the factory by each supplier is noted. The cream book is as follows:—Each page to be divided into columns representing the number of days per week on which cream is delivered, with one on the left hand side for the suppliers' names. Then each column sub-divided as follows:—No. cans, gross weight, tare net. For milk book each page would be divided into eight columns, one on the left hand side for the suppliers' names, and seven representing the days of the week, each of the seven to be divided into the number of lbs. of milk received morning and evening. When the delivery is complete for the day these books are taken into the office and posted up into the daily returns of cream and milk books, which are ruled as follows:—

CREAM BOOK.

First, supplier's name on top of page; then each page is divided into 12 columns, representing the 12 months of the year, with a column on left hand side for date. Each of these 12 columns are now sub-divided into four, thus:—No. can, net weight, test, butter result. Now, this book will save a good deal of writing, as it will be observed that each supplier's name will be written only once in twelve months, besides showing on the same page the number of lbs. cream delivered monthly by each supplier, with the result in butter, or by adding the twelve totals for a period of twelve months. It will also enable you to see at a glance whether the supply is increasing or falling off, or to see the quantity of cream

and amount of butter made therefrom for any period desired.

MILK BOOK.

First the supplier's name on top of page. Then divide into twelve columns, sub-dividing each column as follows:—No. lbs. milk morning and evening. Test—butter result; and as the milk is tested every 7th day rule a space off for the totals right across the page at the end of each 7 days. You will here also have the totals of the weekly and monthly delivery from each supplier, and also for twelve months, under your eye. From the books the account sales rendered to suppliers may be written up weekly, and at the end of the month posted to the credit side of the supplier's ledger.

DAILY SALES BOOK.

This book, although partly financial, being a half brother to the stock book, put it in with the statistical, and it is a very important one, as it will enable you to trace the butter sold daily, and will be a check on the person in charge of that branch. An ordinary small ledger will serve the purpose. Now, for example, suppose we take 100lbs. of butter from stock for local sales. This would be entered on the credit side thus: By amount for stock, say, at 1s. per lb., £5. When the day's work was done the rough books would be brought to the office to balance up. Now, say that the books showed that 25lbs. had been sold for cash, and 25lbs. booked to be deducted from suppliers' accounts, there should then be 50lbs. on hand. The debit side would then be written up as follows:

To cash sales, 25lbs. at 1s.	...	£1	5	0
, credit " 25lbs. " 1s.	...	1	5	0
On hand 50lbs. " 1s.	...	2	10	0
		£5	0	0

If these numbers do not tally there is something wrong. The 50lbs. on hand would then be carried on to the credit side for next day, adding from time to time whatever may be taken from time

to time from stock. You will see that this book acts as a check on the person retailing the butter.

STOCK BOOK.

This book will enable you to trace the output of the churn, and is ruled as follows:—

LEFT SIDE.				RIGHT SIDE.		
Date.	Amount brought down.	No. lbs. cream received.	Lbs. butter made.	Amount for local sales.	Butter shipped.	Amount on hand.
				bns.	lbs.	
						Total.

Now, for example, say on 1st of July 1,000lbs. cream were received or separated at the factory, from which 500lbs. butter were made. These would be put in their proper columns on the left hand side. Then 100lbs., as shown above, were taken for local sales, and, say, 6 boxes or 336lbs. were shipped for sale, then, besides the balance on hand from local sales, as would be shown in the daily sales book, there should be 64lbs. as well, if not, something is wrong. Next the 64lbs. would be posted in the columns, and not down on the left hand side, to be added to the churn result of the delivery, and so on from time to time. Each page serves for a month. You then have the number of lbs. of cream received during that period, with the number of lbs. manufactured therefrom, and also the manner in which it had been disposed.

ABSTRACT OF SUPPLIERS' LEDGER ACCOUNTS.

This is a very useful book, and enables errors to be detected in the suppliers' monthly accounts, besides being a record for each month of the amount of butter sold to suppliers and the value thereof, of the amounts deducted for expenses, and the net and gross amount of each supplier's cheque. It is ruled as follows:—

Suppliers' names.	Credit sales.		Charges, com., &c.	Separating charges.	No. lbs. butter per test.	Cheques.	Total.
	lbs.	value					

It will be seen at a glance that the net amount of cheque, plus the charges, equals the amount in the total column. Hence, when the money columns are added up, the results ought to equal the amount in the total column—if not, there is some error.

Now, I have written more than I anticipated on the statistical ones; it would take too much time to go fully

in the financial ones so I will just simply mention them.

1. Day Book.—A rough book recording the daily transactions, and to be posted from direct into cash book, or accounts in general ledger.

2. Cash Book.—For recording cash transactions to be balanced daily.

3. Suppliers' Ledger.—An ordinary ledger in which suppliers' accounts are kept. The quantities of butter made from their cream being posted from the daily return of cream or milk book to the credit side, and all charges and net amount of cheque on debit side, and then from this book complete monthly accounts.

4. General Ledger.—In which all general accounts are kept.

Poultry Food.

THE experiments of the food values of different grains (says Professor Brooks), have been especially valuable, and the results which have been determined through the lines of work carried on in this direction have greatly modified the hitherto prevalent opinions on the subject. Notably is this the case with the experiment wherein corn (maize) and wheat were directly compared as to food values for profitable egg production. The conclusion arrived at through the experiment upset most of the theories of the feeding value of wheat. It has been supposed, and taught by very many, that wheat was the best food for eggs, and that, generally speaking, under pretty nearly all circumstances it might be depended upon to induce free laying and a remarkably good quality of eggs.

The facts prove that such is not the case, and that Indian corn, which nearly all teachers and many supposedly expert feeders declared to be unfit for the best results in egg production, is really, and all things considered, the best and cheapest food for this purpose; that not only more eggs may be had, but also that a larger

egg, with a better quality of yolk, may also be expected. The fowls fed on corn were found to moult out earlier in the season, to get a better plumage, and to be very much better market birds.

It is probable that the exclusive use of corn is not the best food for either laying hens or market poultry. There is, however, no further reason for doubting that it should form the important staple, and that other foods are necessary only as changes from the regular diet with which to stimulate the appetite and to gratify the desire for variety which is inherent in nearly all living creatures. The use of corn in its various forms, together with a liberal proportion of animal food and a fair addition of green food, will not fail to produce the best results, both to growing poultry and stimulating egg production.

Besides the use of some salt in soft food, enough to sensibly season the mass (concludes Professor Brooks), no condiments need be used, or, in fact, should be. All that is necessary is plain food, and abundance of it. Skimping in feeding, and a too prevalent notion that fowls in

good condition, or, generally expressed, too fat fowls, will not lay well, is one of the errors which has been handed down from former generations. There are at the present day a growing number of poultry-breeders who believe that under proper conditions it is impossible to over-feed either growing chickens or laying

fowls, and that such food as they naturally consume will be utilised either in added growth of frame and flesh or in the increased production of eggs. In other words, that poultry, unlike people, do not eat and drink for the mere pleasure which it affords them.

Rhodesian Redwater.

THE Department has received by telegraph the following extract from the Third Report of Dr. Koch on Rhodesian Redwater :—

“I think that our experiments indicate that best results may be obtained in protecting against African coast fever by using freshly drawn defibrinated blood of recovered animals and injecting animals, which it is desired to protect, sub-

cutaneously with a ten cubic centimetre dose. These injections should be repeated four times, with an interval of seven days between the injections. Subsequently, the inoculations should be continued, lengthening the interval between the doses to two weeks, and later to a month, the dose remaining all the time at ten cubic centimetres.”

Surra Disease.

CONCERNING the surra disease amongst horses in Mauritius and elsewhere, Mr. Leon Ehrmann writes as follows to the *Queenslander* :—In a private letter I received from Mauritius, a friend of mine says :—“I had to buy new oxen, having lost all my stock, and even of the new ones I have lost over 78 per cent. Candidly, I do not believe we will have another animal alive in another six months. The Government are behaving right well, and are allowing a loan for the laying down of tramways and other mechanical transports, payable in ten years, and bearing interest at 5 per cent.—easy enough terms. Besides this, they have also granted a loan on the growing crops for the coming year, which will no doubt help to tide over many

estates from bankruptcy, as on account of the introduction of surra in the island they would not be able to take their canes to the mill without getting money for mechanical transport.” Mr. Ehrmann adds :—“I think it is time for the Government or the pastoralists to take a move in that question, as I consider the introduction of surra into Australia will be much more terrible than the drought, and stamp out the pastoralist industry for ever. I have seen in the papers that a racehorse has been introduced from India recently ; it is time for the Government to put a stop to all communications in that line with India and the Philippine Islands. It is useless to risk ruin to the country to gratifying the fancy of a few racing men.”

Lucerne for Horses.

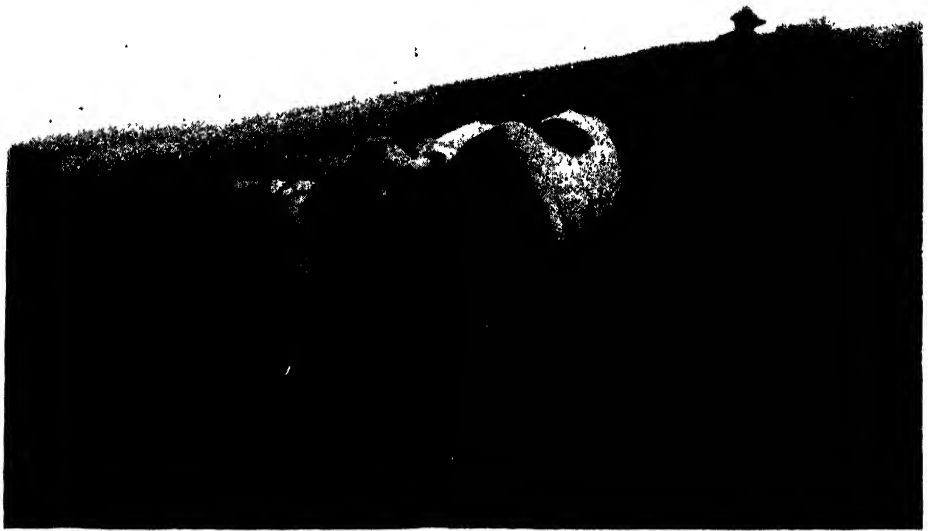
LUCERNE hay is an excellent fodder for heavily worked horses. It keeps them, says a writer in *Rural New-*

Yorker, in good flesh, and lucerne-fed horses have glossy coats of hair such as are secured by feeding linseed oil meal.

Teamsters who have given lucerne a trial for several months usually prefer it to other hay, while those who have fed it for a short time only strongly condemn it. When hardworking horses are first fed lucerne they sweat profusely, have loose bowels, and often urinate excessively. If the lucerne is properly fed, these symptoms pass away in from three to six weeks, and the animals get in good condition and remain so. The writer recently saw a team of heavy Percheron mares that had been fed no other roughage than lucerne for twelve years, and were in nearly what breeders call show condition, although they had been fed little grain. In getting a horse on feed with lucerne hay not over two pounds should be fed the first day, and the horse should be given the same kind of hay as usual. The amount of lucerne fed should be roughage correspondingly increased until at the end of three or four weeks the entire rough feed becomes lucerne. With a good grain ration ten to fifteen pounds of lucerne hay is sufficient for a day's ration for an average horse. When grain is high-priced, eighteen to twenty pounds, and sometimes more, may be safely fed, but after twelve pounds per day is reached, the increase in amount should be made very gradually, and a careful watch kept on the condition of the horse. If any of the symptoms mentioned as occurring when the horse is first fed lucerne appear, the amount fed should be immediately reduced, and kept down to ten to twelve pounds, until the animal gets in good condition, when an increase may again be slowly made. Lucerne makes the best feed for cattle, sheep, and hogs when cut, when only one-tenth of the plants have reached full bloom. It makes the best feed for horses when cut in full bloom, or even a little later. On large farms it is customary to start cutting when the lucerne is in proper condition for cattle; the work will not be completed until some of the lucerne is matured too much for cattle. That cut late is fed to horses. Lucerne that has been over-cured, and thereby lost part of its leaves, is better for horses than for cattle. The fourth

and fifth cuttings of lucerne have a much greater percentage of leaves than the earlier cuttings; this hay is very laxative, and should not be fed to horses. Under ordinary western farm conditions either corn or Kafir corn is the grain fed with lucerne. Equal parts of corn and oats make a good grain feed. It is difficult to give the comparative values of prairie hay and lucerne hay. With a good grain ration a careful feeder will give a horse as many pounds of lucerne hay as he would prairie hay, but he will secure a condition of flesh, skin, and hair that cannot be secured in feeding prairie hay without the addition of linseed meal. On the other hand, if grain is scarce or high the quantity fed may be limited, and an increased amount of lucerne will take its place. The writer saw a few teams during the autumn that were doing ordinary farm work, and were in good condition, that had no other feed than lucerne hay, but the drivers knew how to work and care for their teams, and most teamsters would fail on lucerne alone.

THE WEATHER.—The weather last month was unseasonable to the last degree. There was practically no rain, no dewey nights, and hot, tearing winds from the north were incessant. In Maritzburg the supply of water was wholly insufficient, and in quality it was bad. Millers and others could only get water enough for their engine boilers to run their mills for a few hours during the day, and, as an indication of the nature of the water, it may be mentioned that many consumers of aerated waters are getting their supplies from Greytown and other places where the water supply has not given out. Relief from another source was promised shortly. The pasture for cattle is everywhere unusually very backward; happily, for sheep there is plenty. The September and October of last year were fairly wet months. At the time of writing there are some signs of the drought breaking before long.



HAY-CUTTING IN NATAL.

BIRD SHOWING.

SIR,—As an old fancier, I am of opinion that pigeons should be shown singly rather than in pairs, both from an exhibitor's point of view and because the public can thus see a bird to greater advantage. The judge, too, can give much greater satisfaction when this plan is adopted.

I maintain that where two birds are shown together in such cramped pens as our P.M.Burg Agricultural Show used it is simply impossible to judge birds to the best advantage. I happened, along with Mr. Broadbent, to be judge of pigeons at our last grand show, and the only way we could come to a decision was to take the birds out of their pens, class after class, and place them in a large fowl pen that happened to be vacant. This caused delay and unnecessary trouble, and had it not been for this empty pen it would have

been impossible to judge such birds as fantails and runts—or, in fact, any class—to either our or the owner's satisfaction.

Then again, when pairs are called for, it very often spoils a good bird's chance by having to put an inferior bird with it. In one instance two male birds were shown as a pair, showing that a good hen was not to be had fit to compete.

I would suggest that entries be called next year for separate birds. The exhibits would be better, and the birds would keep clean and in the show condition they were penned. I am importing from home magpies, swallows, and jacobins, and am going to try and work up the fancy in Maritzburg, but I would object to show good birds in pairs for many reasons.

Yours truly,
H. PORRITT.

Howick.

Seven Oaks Cattle Dip.

(Communicated.)

THERE has just been completed at Seven Oaks an Australian cattle dipping tank which will be of great service to the various farmers and stock breeders in the district. The dip, after being completed, was tested by cattle belonging to Mr. Taylor, Greenpoint, and everything went off without a hitch, giving the greatest satisfaction. The tank is of the sliding principal, the crush pens and dripping yards are thoroughly complete. The pens, made of jarrow posts and wattle rails and paved with whinstone, are 40 feet long by 26 feet wide, and 6 feet high. The tank, which is 42 feet long, 8 feet deep, and 5 feet 6 inches wide, contains 3,600 gallons of liquid; sliding doors are placed at each end of crush pen. There is also a collecting yard 60 feet square; this, which the crush pen leads from, is made of strong posts and wattle rails, all being well tarred. The dripping yards are 28 feet by 24 feet, with a division fence forming two yards with floors of concrete, and a

fall of 6 inches leading to the dip tank. All necessary arrangements are made so as to prevent outside water reaching the tank.

The tanks are two 400 gallon tanks set in brick work. The water supply (1,000 gallon tank) is erected on a stand 9 feet high with an outlet into the boiling tank. Underneath this, there is a room 9 feet square for storing the different chemicals used in the dip. The dip was built by Mr. McBride (who has a thorough knowledge of cattle dipping tanks) for the Seven Oaks Dipping Association.

Every day since the dip was finished it has been used more or less. The dip is so complete that 180 cattle and horses were put through successfully within an hour, and up to date there have been over 1,000 head of horses and cattle dipped, and without a single accident. Any farmers, or Farmers' Associations, wishing to keep their cattle clean and healthy, could not do better than have a dip built on Mr. McBride's principle. His plans are good

when executed, and have given every satisfaction. There is no chance of any injury to the cattle when passing through the dip, everything being made so exact and carefully executed. The first dipping tank Mr. McBride built in this Colony was for Mr. Jos. Baynes, M.L.A., Nel's Rust,* the second for Messrs. Clark, Morton, Addison, and Hyslop, M.L.A., Howick; third for Mr. P. Otto, Somerville, Reit Vlei, and this one for the Seven Oaks Dipping Association. An illustration of Mr. P. Otto's was shown in the *Agricultural Journal* on 1st May. Mr. McBride says he has not the least hesitation in saying that the dip built for

*It is perhaps desirable to point out that, in the building of this dip, the builder was working entirely under the instructions of the owner. The plan of the dip was adopted from plans of dips brought to this Colony by Mr. Booker, of Queensland.—Ed., *Agricultural Journal*.

the Seven Oaks Dipping Association is the best in Natal. Mr. McBride has great credit for introducing this dip into the Colony, which farmers will find it to be a great boon and saving of cattle. Any farmers or associations wishing to communicate *re* the above, can easily do so by writing to Mr. Alexander, manager to Mr. Joseph Baynes, M.L.A., Nel's Rust. The style his pens are put up which lead into the tank are good, and the tank itself on the sliding principle leaves nothing to be desired. Cattle on no account can turn in the tank when swimming through; practically speaking, there is nothing left undone by Mr. McBride in his construction of dips.

It may also be mentioned that Mr. Comins has fixed up in a ravine, 700 yards distance, a windmill to supply water to his farmstead, and the mill will also supply the cattle dip with water. Mr. McBride is presently fixing a large dip at Mr. Fannin's farm, near Dalton, and on the same principle.

Messrs. Booker's Estate.

THE name of Mr. C. J. Booker, of Queensland, will not be entirely unfamiliar to the readers of the *Journal*. It will be remembered by many that the cattle imported by the Hon. J. Baynes, M.L.A., were selected and accompanied to Natal by Mr. Booker. Unfortunately, the mortality in the shipment was immense, but despite the heavy pecuniary loss arising, Mr. Baynes always affirms that he regards it with satisfaction, inasmuch as it led to his building a dipping tank. The freeing of his cattle by systematic dipping Mr. Baynes looks upon as the amplest compensation for the losses. In the designing of the dip, Mr. C. J. Booker gave valuable suggestions. At the same time the report of an interview with this gentleman appeared in the *Journal* (No. 23, Vol. IV.) A lengthy illustrated article describing Messrs. Booker's Woollooga estate appears in a recent number of the *Queenslander*; we take over the portion dealing with cattle:—

THE BEEF HERDS.

The owners of Woollooga have two other station properties where cattle are bred as stores, and then brought to Woollooga to be "topped" up for market. These properties, Mungy and Lochaber, which are conjoined, are situated on the Upper Burnett. The firm breed Shorthorns of an excellent type, and for this purpose a stud of Shorthorns are kept at Woollooga, where bulls are bred and drafted to the breeding stations. In company with Messrs. E. G. Booker, and C. J. Booker, the manager, a party was formed and a tour of the holding made. At about five miles from the homestead we cross over a portion of the famous Widgee estate owned by Mr. Lionel Wienholt. This estate comprises 40,000 acres, and in point of fertility and grazing capacity is a worthy compeer of Woollooga. A mile or two across Widgee we arrive at an outlying portion of Woollooga, and here we find a grand herd

of Herefords. These were purchased as stores from the celebrated Hereford herds of Mr. Christensen, Lammermoor, North Queensland. The pastures of Woolooga have shown their fattening capabilities in the splendid condition of these cattle. The stockmen round up a herd and we photograph it. It was a pleasing sight to see these sleek animals revelling in their well-developed beef proportions. It was obvious that the framework had been well designed by careful breeding and selection, and the Woolooga pastures had ably done its work, filling in the angular outline with beef of the highest quality, from the ears, so to speak, to the tail, continuing the laying on process almost to the hocks. We have ample evidence of the greater value derivable from cattle bred to that standard of efficiency, which experience and skill have wrought in animal breeding.

Several Shorthorn bulls were purchased at the recent Sydney show from Mr. Angus, the well-known South Australian breeder. In country like that under notice, the Shorthorn does well, and is, perhaps, more profitable than any other kind of cattle. The Hereford has shown wonderful powers of endurance in combating the adverse influences arising from periods of scant pasture, and in travelling long distances for water. Nearly every breed of cattle is influenced by environment, and when it is found that certain breeds mark their adaptability to a locality, in these lie the greater profit. The Shorthorn, apparently, can be bred and fattened successfully in the coast districts. The Hereford has proved its worth in traversing the wide areas of the West, when other breeds have failed. The Hereford has also shown that he is capable of being fattened on the better pastures of the coastal lands, though far away from where he was raised.

The cattle on Woolooga are dipped eight times during the year in a preparation consisting of 6lbs. of arsenic, 18lbs. washing soda, 20lbs. ordinary soap, and 5 gallons of Stockholm tar to 400 gallons of water. The composition is boiled for four hours. The cattle are immersed in this in the ordinary dip. Mr. Booker

states that the dipping completely destroys the ticks. It also quiets the cattle in a remarkable manner. Prior to the fat cattle being trucked to Maryborough or Brisbane they are put through the dip to accustom them to being herded closely together. Previously it was found that the cattle bruised each other considerably in transit when in the trucks, but since the herding, yarding, and dipping, it is rare that a beast is bruised while in the trucks, the operation apparently tending to ameliorate the unfriendly temperament cattle frequently evince towards each other when in close quarters. The Woolooga herds are carefully graded as to colour, and placed accordingly in separate paddocks. For instance, all whites, roans, reds, and non-descripts are kept separately, and in that manner submitted to market. Herds of a distinctive colour are certainly more pleasing to the eye, and invariably bring a better price when they are of various colours.

THE MILKING HERDS.

Red Polls are being raised for milking purposes, Messrs. Booker being evidently of opinion that in the polled breeds there should be animals of a milking strain which should prove worthy competitors among the milking kind of the world. In this they are not alone, for the Red Polls have been and are now honoured throughout those countries where they have been tried, as a thorough dual-purpose cow. The inheritance of prolonged milk-yielding is one of the points in the Red Polled breed which is being cultivated with much advantage and success. The breeders have, moreover, accumulated evidence to prove that the inheritance must be studied in the breeding of the bull as well as the dam. Hence the particular care now being exercised in the choice of the bull. The foundation of the Woolooga herd of Red Polls is from the imported bull Cassius. This bull was purchased from Captain P. Charlie, of Belmont, New South Wales, a gentleman who has a specially fine herd of these cattle. Cassius was mated at Woolooga with pure Shorthorn cows. As

showing the remarkable prepotency of the animal, the horns of the dam did not appear in the offspring. The bull had marked his characteristics so forcibly that the horns of the Shorthorn were completely bred out in the first cross.

It is remarkable to note that the grade heifers from this cross are superior milkers to their mothers, and this is an evidence that a very valuable class of dairy animal will be found in this Red Poll-Shorthorn cross. So satisfied are the Messrs. Booker with the result of the cross with the Shorthorn and Red Poll that they have sent six young Red Poll bulls to Mungy station with a view of breeding out the horns of the entire Shorthorn herd. Very many of the higher-bred Red Polls have a comparatively small but well-shaped udder, the milk holding up in the knotted veins. What used to be considered the beef-producing form is thus found in this dual-purpose cow, which demonstrates herself also a milker, having the great staying powers that tell in the year's return of butter fat and milk. It is not an uncommon occurrence for a Red Poll cow in full vigour to not have a dry period between two calvings, or, at the most, a few days. On the other hand, some cows have acquired a habit of continuous milk yield for two years or even more, but then they require a resting time of from three to six months. In that milk-yielding period a big total is run up, and the butter fat is fairly steady most of the time. It has been found advantageous in the Red Poll herds in England to foster the milking habit by continuing the milking as long as possible after a heifer has dropped her first calf. Some of the results recorded of this breed of cattle as milkers and butter makers are so extraordinary that they are worth the attention of our Queensland dairymen, especially those who find it to their advantage to have a dual-purpose herd.

The question of breeding out horns in either beef or dairy cattle has a significance both from an economic and humane point of view. In a report before us it is estimated that not less than 200 persons are injured in the United States annually by cattle horns, and that

by the same means 100,000 cattle, horses and colts, and innumerable sheep and swine are annually destroyed; that two-thirds or three-fourths of all the tremendous losses by abortion, especially among cows, and in a large degree among other stock, if carefully investigated, could directly or indirectly be traced to the presence of horns; further, that in railway transportation of horned cattle matured for beef, and hence when at their very maximum of value, one or more animals in every car load are horn-gouged or bruised in such a way that, if then discovered, a reduction is made in price by the buyer, and, if not noticeable until showing itself in bruised and clotted blood spots on the dressed carcass, entails a loss on the butcher or preserver.

If such conditions as those outlined present a problem to the stockman, surely he may find it simplified, if not wholly solved, through the rearing of cattle harmless because hornless—peaceable because polled. Cattle-raisers of our generation may readjust the methods in a manner which all enlightened experience shows to be not only more humane but more profitable as well. The highest intelligence would seem to suggest, if not dictate, a management most likely to result in the largest return for the least risk and smallest outlay. Who can measure the diminished secretion of milk in every dairy herd where the cows with biggest and sharpest horns make life a burden and death a restful consummation for their more timid and weaker sisters?

Messrs. Julius Harvey & Co, 11, Queen Victoria Street, E.C., have just shipped to South Africa a special six-ton steam motor-wagon. The vehicle was thoroughly tested before despatch with a full load, one trial being on a long hill, with gradients of one in seven, which was successfully negotiated both up and down. With a trailer this motor was found easily capable of taking a load of nine to ten tons. For the West Coast Messrs. Harvey are also supplying a light steam motor-wagon suitable for loads of twenty to forty cwt. and for which there is also a good demand.—"South African Exports."



DRAUGHT OXEN IN ENGLAND.

Abortion in Cows.

(To the Editor Agricultural Journal.)

SIR,—I shall be glad if any of my fellow farmers will give their opinions as to the cause of abortion in cows, and, if any, what preventive measures should be taken.

My neighbour and I last season exchanged bulls, and about June-July my neighbour's cows began to slip their calves. I believe he lost seven within a few weeks, and he blames my bull for this without any reason. I maintain that the bull had nothing whatever to do with it, and I have it on veterinary authority that the bull could not be the cause, un-

less he had had connection with a cow after abortion, and thence infected the other cows from that source, but in this case the cows were all in calf at the time of the first abortion, consequently no connection with the bull took place; also, that the subsequent abortions were caused by sympathetic contagion, the first case not having been removed from the troop.

Any information on the subject will be thankfully received by

FARMER.

The French Military Ride.

THE recent military ride from Paris to Deauville has been got through with fewer mishaps than occurred last year in the ride from Brussels to Ostend, and this was, no doubt, due to the wise precautions taken to prevent the horses competing from being asked to do too much. The ride was divided into two sections, the first being from Paris to Rouen, and the second from Rouen to Deauville. In the first section of the ride the speed was limited to a trifle over six miles an hour, and any competitor who exceeded that speed became *ipso facto* disqualified. The second section, from Rouen to Deauville (a distance of 11 miles), had no speed limit, but none of the competitors had any object in overriding his horse, because before the classification was made and the prizes awarded the horses which had done the journey had, on the following day, to go through their paces—at a walk, a trot, and a gallop—to prove that they were none the worse for their journey. The start from Rouen was effected very early in the morning, and the first three officers to arrive were M. Degorge, Lieutenant of Dragoons, riding his

thoroughbred Puerto, which had won a large steeplechase at Auteuil this spring, and M. Petit, Sub-Lieutenant of Cuirassiers. But they were both beaten on the time allowance, by M. Bensil, Lieutenant in the 28th Dragoons, and the winner of the Brussels-Ostend race last year. He was riding his thoroughbred Midas, and this animal, which had shared his Brussels-Ostend triumph, had recently carried him in a long-distance ride of 250 miles. He covered the distance between Rouen and Deauville in 4 hours 11 minutes, while the second horse did the distance in 4 hours 18 minutes; and the third place was taken by an officer riding a thoroughbred closely related to the famous mare Plaisanterie. Altogether, twenty-six of the thirty-two competitors completed the distance within less than an hour's interval, and though it is much to be regretted to read the report that two horses were ridden to death, all those that came past the judges at Deauville had evidently taken great care of their horses on the road, and had them so fresh that most of them were ready to go on again.

Refrigerator Cars for the Cape Railways.

FROM a description of these cars in "South African Exports" we take the following:—

The inside dimensions of the body of the wagons, which are each equipped with the vacuum and hand brakes, are 36 ft. long, 6 ft. 6 ins. wide, 7 ft. 6 ins. high. The cars have been specially built with the sides, roofs, and floors 6 ins. thick, those being composed of (i) Tongued and grooved boarding running vertically, and then insulated paper laid in the middle, in addition to which is tongued and grooved boarding, which is securely fastened to oak frames. On the inside of the frame is tongued and grooved boarding, running horizontally, and a second layer of insulating paper. Then follows more grooved and

tongued boarding on the outside, the interstices of the frames being closely packed with cork. At each end of the cars special ice boxes are fixed, each box to carry two tons of ice. These boxes are placed in such a way, and shrouded with diaphragms, that a cold draught is set up internally in the wagon, the water being carried off through a hovel drain in the floor, specially lined with zinc, leading into drip pans underneath the floors of the wagons. The doors are made absolutely air-tight, being specially lined with canvas padding filled with horsehair, the greatest care having been exercised to ensure the wagons being air-tight, the resultant being that the contents of the cars will be kept cold during the whole period of transit.

Value of Botanical Gardens.

THE following appreciation of the usefulness of Botanic Gardens, and in particular of the Royal Gardens at Kew, is taken from "Botanizing," that excellent practical book for field botanists, written by Professor W. W. Bailey, of Brown University, U.S.A.

As an instance of the beneficent influence of botanical science the records of the Royal Gardens at Kew may be cited. Under the directorship of Sir William Hooker, and later of his son, Sir J. D. Hooker, and at present under that of Sir W. T. Thistleton-Dyer, it has accomplished wonders for the education and delight of countless throngs of visitors. But its work does not cease with this objective teaching; it constantly enriches the many Colonies of Great Britain. One of the annual reports of this truly Royal Garden contains a complete reply to any carping criticism of Botany.

Here is, no doubt, the largest herbarium in the world; here botanists, gardeners, and explorers are trained; here are conducted experiments of most varied

and useful character. By means of Kew coffee, cinchona, cotton and many other important products have been extended to different countries. All the Colonial as well as many foreign gardens are in touch with Kew. Every new plant is here examined, every supposed drug or fabric tested as to its value. Improvements as to cultivation are suggested, means of protection instituted. Kew is now conceded to be one of the most practical, best paying, of all Britain's national institutions; it is honoured alike at home and abroad.

Who can fitly estimate the amount annually saved to the farmer by the researches of botanists and entomologists? The student of fungi alone becomes a benefactor, for mould, blight, and mildew, as well as many of our own diseases, arise from the prevalence of active spores. We should then in all ways, encourage those who, with microscope and chemicals, wage upon these pests an unrelenting war.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Zietsman ...	Snelster
		"	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	A. C. Harding ...	Meadow Bank
		"	C. J. Labuscagne ...	Haasfontein
		"	R. Wood ...	Willowford
		"	A. J. Harding ...	Marshlands
		"	J. Snyman ...	Vitzicht
		"	J. R. Vandermerwe ...	Welgekosen
		"	B. J. Vandermerwe	Noodhulp
J. Button:	Estcourt, South of Bushman's River	"	J. Haw ...	Woodleigh
		"	J. Lawrence	Grantleigh
		"	W. Fletcher ...	Erina
		"	H. Albrecht ...	Brynbella
		"	J. Marais, jun. ...	Northcote
		"	J. J. Marais ...	Malan Spruit
		"	C. P. Marais ...	"
		"	F. Symons ...	Glenbella
		"	D. Mackay ...	Dalton
		"	G. Cope ...	The Hoek
		"	C. R. Leroux ...	Moras Vlei
J. J. Hodson ...	Lion's River ...	"	W. Henderson ...	Hilton
		"	M. A. Sutton ...	Shaw's Flat
		"	Jos. Raw ...	Buffel's Bosch
		"	D. C. McKenzie...	Lion's Bush
		"	R. J. Spiers ...	Owthorn
		"	Jas. King ...	Lyndoch
E. J. B. Hosking ...	Upper Umkomanzi	"	J. W. T. Marwick	Mona Glen
		"	W. P. Gibson ...	Howard's Hall
		"	A. H. & R. H. Cockburn	Durslade
		"	Seyaga ...	"
		"	C. P. Lewis ...	The Hill
K. Soutar ...	Portion of Lion's River	"	A. Clouston ...	Nottingham Town Lands
W. Wilson ...	Polela ...	"	C. A. Phipson ...	Strathcampbell
		"	J. Comrie ...	Hepburn
		"	H. Pennefather ...	Home Rule
		"	T. Palframan ...	Watermead
		"	A. C. Thurston ...	The Rocks
		"	J. D. Watson ...	Rainbow
		"	D. O. Arbuckle ...	Kenridge
		"	J. Hayes ...	Glen Gariffe
R. Vause ...	Ixopo ...	"	W. H. Walton ...	Greenvale
		"	A. E. Keith ...	Norwood
		"	J. Harper ...	Balnahard
		"	A. Knight ...	Highflats
		Lungeickness	W. Gold ...	Rockvale
J. A. Trenor ...	Alfred ...	Scab	Umpapu	Location
		"	Gelatu Duly Um	Location
		"	banjana	Whetherby
		"	B. Mack ...	

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
W. Gray	Upper Tugela, South of Tugela River, and Estecourt, North of Bushman's River ...	Scab	N. J. Vandermerwe	Gourton
		"	W. P. Gray ...	The Heff
		"	C. M. Pretorius ...	Strydpoort
		"	J. van der Westhuys	Misgunst
A. H. Ball	Weenen	Lungsickness	Seddon & Harris	Weenen Commonage
		"	J. W. Harris	New Settlement, Weenen
		Scab	C. R. Leroux ...	Waterfall
		"	1. J. Lotter ...	Waterfall
		"	J. P. Lotter ...	Berg Vleit
		"	J. J. Vermaak ...	Winterhoek
		"	G. J. Vanderwesthuys	"
		"	C. J. van Rooyen	Annadale
		"	C. P. F. van Rooyen	Mona
E. Varty	Umvoti, Western Portion	"	G. T. Van Rooyen	Pampoenek
		"	J. G. Nel	Elladale
G. N. Perfect ...	Umvoti, Eastern Portion	"	W. H. Mayne ...	Mistley
		"		
C. J. van Rooyen...	Krantzkop ...	"	L. J. Nel	Diepfontein
R. J. Raw	Impendhle ...	"	S. Faber	Virginia
		"	E. Allborough ...	New Forncett
		"	Geshla	Impendhle Location
		"	Makekwana ...	"
		"	H. Hill	Coquidale
C. Swales	Umlazi	Lungsickness	P. J. Field ...	Richmond Farm, near Pinetown
		"	Native, Sam Pawke	Assegai Kraal, near Betha's Hill
		"	John, & Mr. Kirk	Umlazi Location
		"	Miss Scott ...	Glenogi, New Germany
A. Hair	P.M. Burg City and Umgeni	Scab	Umbabana	Zwartkop Location
E. G. Clerk	Newcastle	Lungsickness	Dundu	Styl Krantz
		"	S. W. Reynolds ...	Newcastle T. Lands
A. J. Marshall ...	Dundee	Scab	Sai M'Lief ...	Banff
		"	N. Glutz	Swiss Valley
		"	H. Thorn	New Port
		"	Willie Africa ...	Waschbank
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gunena ...	"
		"	J. H. Hatting ...	Hattingsvale
		"	P. H. Marshall ...	Cleveland
		"	D. Meumann ...	Hazeldean
		"	J. A. Landman ...	Boschfontein
C. E. Walker	Umsinga	Lungsickness	W. H. Boshoff ...	Pomeroy T. Lands
		Scab	Mflatela	Mazaliego
		"	Umsbakoma Quti	Vermaak's Kraal
		"	O. J. de Villiers ...	Vermaak
		"	Umgota Mbata ...	Mumbe
		"	P. R. N. Vermaak ...	Balgownie
		"	S. J. Vanderwesthuysen	Pomeroy
J. Chaplin	Klip River ...	"	S. Schoeman ...	Maritz Drift
		"	P. Nicholson ...	Hobsland

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
J. Chaplin	Klip River	Scab	W. Leathern	Clydesdale
		"	Mrs. M. K. du Plessis	Maggiesdale
		"	J. C. Buys	Reit Kuil
		"	P. K. Dalebont	Maggiesdale
		"	J. L. Marais	Meyer's Hoek
		"	D. P. Conradi	"
		"	A. J. Marais	Waterfall
		"	Stomoko	Blauwbank
		"	J. Stomoko	Reit Kuil
		"	Botchu Luchaba	"
		"	Umbotshwa	Vlaakplaats
		"	Thompson and Natives	Doornkloof
		"	P. H. de Villiers	Good Hope
		"	J. Bardner	Brakwaal
J. M. Wales	Upper Tugela, N. of Tugela River	"	W. O. Coventry	Goodoo
		"	S. Sharratt	Klein Waterfall
		"	J. Reed	Fairfield
R. Wingfield-Stratford	Utrecht	"	J. Voss, sen.	Charlestown
		"	H. Benkes	Roodekop
		"	P. H. Nel	Blauwstroom
		Lungsickness	H. Benkes	Roodekop
		"	P. Cys	Blood River
G. Daniell	Vryheid	Scab	B. E. A. Rabe	Emyati
		"	Sikwata	"
		"	L. Botha	Waterval
		"	Ndotyane	Rustplaats
		"	Hawse	Kromellenbourg
		"	J. B. Steenkamp	Rustplaats
		"	G. H. Steenkamp	Bloemhoff
		"	W. Pretorius	Denny Dalton
		"	Z. de Jager	"
		Lungsickness	C. Birkenstock	Hlobana
		"	Nqumbi	Emyati
		"	Inkunya	Tweefontein
C. T. Vaughan	Paulpietersburg	"	Ndanuse	Uitval
		"	J. Vanden Heever	"
		"	Mcatu	Haasfontein
		"	W. Craig	Frisehegewaagd
		Scab	E. Kloppe	Wachteenbeetje Spruit

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P. V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	1 for Lungsickness	0 for Scab.
" Nkandhla and Ngutu Districts...	...	...	1	" "
" North of White Umfolosi and Umfolosi Rivers	...	...	—	— "
Total	...	...	2	0

Binderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkandhla, and Entonjaneni Districts.

Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 30th September, 1903.

Pound Notices.

THE following stock, unless previously released, will be sold on the 4th of November next:—

Estcourt.—Six Kafir goats as follows: Two black and white ewes, cut in left ears, and piece out of right ears. One white ewe, with two kids sucking, has a cut in right ear, and left also.—White Kapater goat, piece out of right ear, and a clip in left ear.

Reported by R. Horner, of the Farm Remainder.—Blue and white cow, right horn broken, aged, long tail, indistinct brand left rump.—Black and white heifer, 18 months old, branded indistinctly left rump D.—Also red ox (since dead).

Erin.—Three merino sheep, branded on off side B. H. and K. S.

Thornville Junction.—Bay mare, about 13.2 hands, no marks or brands. Impounded by Natal Police.—Black ox, white face, long wide upstanding horns, very old and poor.—Small black cow, short horns, white on neck, dewlap, and udder. Impounded by Natal Police.

Stanger.—Running at the Kraal of Dikana, Nonoti Mouth—A red Madagascar ox.

Dundee.—Running on the Farm "Fluit," and reported by Mr. W. Stein.—One bay mare, no brands, about 14 hands 2 inches.

Greytown.—Black heifer, small white on brisket, small white stripe on left cheek, long tail, heavy in calf, well-bred, appears to be a Shorthorn, age about 4 years, no brands or marks visible.

Running on the Farm Greenwich, Reit Vlei, and reported by Mr. M. Morton.—Black and white yearling ox, with wide spreading horns, no brands.

Ladysmith.—Four Kafir sheep ewes (black). Two Kafir sheep ewes (black and white, lambs).—One Kafir sheep ewe (black, lamb).

Fort Louis.—Brown horse (stallion), two white after legs, small star, branded left hind quarter L. M., very mangy, about 14 hands. Probable value £5. Impounded on the 5th September by M. Delport. The above animal will be sold at the expiry of one month from this date, 15th September, if not previously released.

Erin, Drong Vlei.—Merino ram, branded N. on near side and half circle on rump. The above animal will be sold at the expiry of one month from this date, 15th September, if not previously released.

Acton Homes.—Bay stallion, black points, no brands or marks, about 8 years old. Probable value £10. The above animal will be sold at the expiry of one month from this date, 18th September, if not previously released.

Estcourt.—White Kafir ram goat, cut in ear, right clip in left do. The above animal will be sold at the expiry of one month from this date, 14th September, if not previously released.

Dundee.—Running on the farm "Good Hope," and reported by Messrs. Cross & Co.—Black and white cow, branded C. V. off flank.

Mahlabatini.—Two year old bull, white back and belly; dun sides. Probable value, £4. Impounded 22nd September by the Resident Magistrate. The above animal will be sold at the expiry of one month from this date, 23rd September, if not previously released.

Hope Farm, Newcastle.—Bay stallion, black points, branded A. C. or A. G. off quarter, height about 14.2, aged, white star forehead. Probable value, £15. Impounded on the 19th September by R. Harrison. The above animal will be sold at the expiry of one month from this date, 19th September, if not previously released.

Highbury.—Bay stallion, about 13 hands no brands or marks, about 3 years old. Probable value, £6. The above animal will be sold at the expiry of one month from this date, 21st September, if not previously released.

In the State of Iowa there are a number of persons who make a regular business of fattening horses for sale in the Chicago market, animals in heavy flesh selling much better than those in low condition. The horses are usually bought by the "feeder" in the autumn, when farm work is over, and stabled, to be fed up by degrees to avoid risk of colic and kindred ills. When on full fattening rations each horse is given from ten to fourteen ears of maize in the morning, the same at noon, and again in the evening, with three quarts of oats and bran, and as much hay as they will eat in the middle of the forenoon and in the middle of the afternoon. No food is given between 6 or 7 p.m. and five in the morning. The horses are watered twice a day, and are allowed to drink as much as they can. Owing to the number of horses taken up thus to fatten, they get no exercise, but are kept idle in the stable till a few days before they are marketed. The gain in weight shown under this system is very marked. In one case, it is stated, a horse gained 5½ lb. weight per day for a period of fifty days. In several cases with as many as a dozen horses, 3-4 lb. weight per day was gained throughout a period of ninety days.

District Reports.

BULWER, 26th September.—The last fortnight the weather has continued dry and hot. During the last week on the 23rd and 24th storms threatened, but no rain fell at Bulwer except a few drops. In the Deepdale district heavy rain seemed to fall, especially along the Seven Mile Bush. The Umkomanzi Valley is parched, and rain is required badly to bring on the grass. The forming up of storm clouds the last few days seem to be an indication that we may expect steady rains in October. Sorry to say the locusts have appeared in the Division in enormous swarms. I have not heard of any damage done by them to crops, but I am very much afraid they would hardly fail to do so. They have cleared the grass in some localities. The lambing this year is exceptionally good. It seems dry seasons are far more favourable than wet so long as there is grass for the ewes. Farmers complain that the vultures are very troublesome, and a close watch has to be kept over the newly born lambs or the vultures snatch them up in no time. The Bulwer Village is suffering from a water famine, the reservoir being empty unfortunately. The reservoir was emptied for cleaning purposes in July last, and the springs being low then, and almost dry now, no water has accumulated. The water in the small sluits is getting quite offensive, and householders will have to be very careful to have their water boiled or fetched from springs that are still running freely. The Polela Rifle Association holds its half yearly prize competitions on the 29th inst., and I understand there is to be a large attendance. The Natives in the district are getting hard pressed to keep their families supplied with food; they are running about trying to borrow money all over the place at the last moment to buy supplies before turning out to work; under such circumstances it is difficult to sympathise

with such improvident people. It is quite clear that the Natives will not work for long, and necessity, in whatever form it may be, seems their only benefactor. As far as I know all kinds of stock are free from disease except horses, which are still infected with mange. While visiting the Location and Crown Lands in the Umkomanzi I called at Mr. H. E. Mingay's farm, Inglenook, and had a look over his new watermill. Mr. Mingay, in a quiet way, has not let the grass grow under his feet since his return from a trip to the Old Country and Continent. The new mill has a water race over 1,000 yards long; everything connected with the mill is of the most up-to-date as regards improvements. The mill will be a great boon to the Railway Contractors in the Natal-Cape Line, and supply the farmers with a long-felt want. The mill is capable at full pressure to do bone crushing on one side, and mealie meal on the other at the same time. The Railway Bridge at the Umkomanzi is advancing rapidly under that energetic contractor, Mr. Anderson. I was surprised to see all the earthworks to the Umkomanzi River almost complete. It is a pity the contractors on Northern sections of the Railway cannot make more headway.

H. W. BOAST, Magistrate.

IXOPO, 28th September.—About two months ago natives commenced to plough, but owing to the dry weather they had to cease, and the drought has now become severe, and there is little grass for stock. The natives are very short of food, which, no doubt, causes theft but owing to the good work done by Detective Officer Walton the thieves are becoming very cautious, especially as a Chief has been arrested and is now in Gaol awaiting trial for stealing Mr. A Stone's sheep.

F. E. FOXON, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

There is nothing of importance to record since our last report. One would hail with delight any change calculated to enliven or throw a ray of hope upon matters commercial, but, unfortunately, the outlook is far from rosy. In addition to that, almost equal to what is sometimes experienced in summer, drought continues, locusts are flying about in millions, and matters agricultural are about as bad as they possibly can be.

Mealies.—The market is still being supplied with imported Mealies, at prices about the same as given in our last.

Hay.—From 1s. to 3s. 7d. per 100 lbs.; bedding, from 6s. to 13s. per load.

Forage.—Baled forage is in demand, and prices have fluctuated between 4s. 2d. and 9s. 9d. per 100 lbs.

Pumpkins.—From 6s. to 16s. 6d. per doz.

Green Barley.—The quantity coming forward has somewhat decreased, and prices have varied between 2s. 9d. and 3s. 1d. per 100 lbs.

Peas.—Not many offering; the average price being 21s. 6d. per 100 lbs.

Beans.—From 11s. to 30s. per 100 lbs.

Onions.—From 5s. to 10s. per 100 lbs. There is a good demand, but the supply is small.

Lucerne.—Small quantities are coming forward and realizing about 2s. 6d. per 100 lbs.

Tobacco.—About 3½d. per lb.

Butter.—A fairly good supply coming forward, and prices range between 1s. 3d. and 2s. 2d. per lb.

Eggs.—It is a long time since eggs have been so plentiful; the lowest realized was 1s. 1d. per dozen, the highest 1s. 9d. per dozen.

Poultry.—There is a good demand for poultry, and prices have fluctuated between 1s. 4d. and 4s. 3d. for common fowls; ducks from 4s. to 9s. 9d. per pair; guinea fowls 3s. 9d. to 10s. 3d. per brace; geese, 7s. each; turkeys (cocks), 15s. to 19s. each, (hens) 5s. 9d. to 8s. 9d. each.

Sundries.—Very little beef or mutton has come forward during the last fortnight, the latter has realized from 8d. to 1s. 6½d. per lb.; pork, from 4d. to 8d. per lb.; ham, from 7d. to 1s. 1d. per lb.; bacon, from 6d. to 8½d. per lb.; rabbits, from 1s. 6d. to 1s. 9d. each.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, celery, eschalots, lettuce, onions, peas, radishes, rhubarb, tomatoes and turnips.

Fruit.—Apples, bananas, grenadillas, lemons, limes, loquats, mandarines, naartjes, oranges, papaws and pineapples.

Firewood.—A good supply forward. Bales, from 5d. to 10d. per 100 lbs.; cut firewood, from 11d. to 11½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds writes:—

General.—Business remains dull, and the depression becomes more accentuated as the months go by.

Meaties.—Holders quote 11s. in bond for white South American, and 13s. for North American. Stocks are not so large as formerly, but there are considerable quantities of inferior grain offering owing to heating and other causes.

Potatoes.—The market is fairly well supplied as usual, though prices range from 15s. to 25s. per bag, in consequence of the variation in quality.

Forage is in small demand, and rates unchanged.

All other produce in full supply with nothing worthy of remark.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1960, writes:—Since my last report there is not very much change in our market. A good supply of oat-bay has come forward to the Cape Colonial produce dealers who are anticipating a good crop for the new season which will be ready very soon. As much of the old season's crop as possible is being forwarded. The prices realised are cheaper than what it could be landed for had it been bought from merchants at the Cape. The prices are:—

Barley for seed, per 163 lbs.—Not much has been offered, though prices were very good: from 17s. to 19s.

Barley for forage, per 100 bundles.—A large quantity arriving daily, and good quality is selling well; 15s. to 22s. 6d.

Bedding, per load.—This realises very well, and daily large supplies are coming forward; 8s., 10s., 20s. to 40s., according to size of vehicle.

Bran, per 100 lb. bags.—No South African bran offering, only Argentine; from 7s. 6d. to 8s. per bag.

Bales of Chaff, per 100 lbs.—There is a good demand for this, and very little coming forward: 7s. 6d. to 9s.

Kafir Corn, per 203 lbs.—No South African corn offered, only Bombay red and white: prices are lower than what it cost to import: white, 18s.; red, 21s.

Manna Hay, per 100 lbs.—There is very little offered lately, and what does come forward is of indifferent quality; from 8s. to 8s. 6d.

Natal Hay, per bale, about 60 to 70 lbs.—Not much has been sold this week, and now that we have had a little rain, causing the grass to shoot, cattle owners are not going in much for this line. Prices, 1s. 6d., 2s. to 2s. 6d.

Oat Hay, per 100 lbs.—Any amount coming forward, which caused our market to recede again; 7s. 6d. to 8s. 3d., 9s. to 10s. 6d.

Onions.—There has been a spurt in the market on this line, prices going up all of a sudden on good lines. Best, 29s. 6d. to 30s.; medium, 22s. to 24s.; inferior, 12s. to 20s.

Potatoes, per 163 lbs.—Only small quantities of good stocks coming forward, and good qualities realise from 27s., 30s.; medium, 24s., 25s.; inferior, 18s., 20s.

Eggs.—Local fresh, 3s. to 4s. per doz.; Colonial imported fresh, 1s. 9d. to 2s. 3d. per doz.; foreign imported fresh, 1s. 3d. to 1s. 6d. per doz.

Poultry.—Ducks, 8s. to 9s. each; fowls, 3s. to 3s. 6d., 4s. 6d. to 6s. each; geese, 9s. to 11s. each; turkeys (hens), 12s. 6d. to 15s. each; (cocks), 20s. to 25s. each.

Live Stock.—Slaughter oxen, £25 to £27 10s.; trek oxen, £20 to £22 10s.; milch cows, £20 to £30; dry cows, £12 to £18; heifers, £12 to £18; tollies, £10 to £12 10s.; sheep and goats, 20s. to 30s.

Weekly Rinderpest Report up to 30th September, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 26th May, 1903, to date.
<i>Zululand.</i>			
Eshowe District	9	18	255
Umlalazi District	5	10	125
Nkandhla District	6	4	281
Mahlabatini District	10	18	102
Entonjaneni District	6	7	12
<i>Vryheid District.</i>	20	30	178

M. J. HIME,
30th September, 1903. for P. V. SURGEON.

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Central Experiment Farm.

FURTHER REPORT ON MANURE EXPERIMENTS.

BY THE DIRECTOR OF AGRICULTURE.

MAIZE ON HILL AND VLEI SOIL.

THE complete results of the maize manure experiments of last season at the Central Experiment Farm are now available, and they furnish some interesting facts. The striking contrasts between the manured and the unmanured plots on the hill soil will be within the memory of all who saw the growing crops. To those who did not see them, the accompanying two illustrations will give some idea, though they cannot convey the vivid impression afforded by the crops themselves as seen in the field. The actual figures obtained on weighing the crops show the contrasts more strikingly than the photographs do. Thus plot 5, without manure, yielded only 330 lbs. of grain per acre, while plot 4, which was heavily manured, yielded 1,700 lbs. per acre, or more than five times as much; and plot 6, which received a medium dressing of superphosphate and potash salt, yielded 1,590 lbs. per acre. The conditions were all unfavourable to the growth of heavy crops; the season, as every one knows, was an

unusually dry one; the ground had been only just broken up, and was in a very rough state; and the soil was exceptionally poor, so poor, indeed, that the neighbours expressed the opinion that if we could grow crops on it we could grow them anywhere. The average yield of the hill soil in its natural state on the horsetooth plots was, under these conditions, only 364 lbs. maize grain per acre, or 1 2-3 muids. The best manured plot yielded 8½ muids per acre. The average yield of European maize crops in Natal in a good season is 5 1-3 muids per acre.

For a general description of the nature of these experiments, readers are referred to the 20th February 1903 issue of the *Journal*. Briefly, it may be here stated that there were six sets of these experiments, two large sets and two small sets on the hill, and two small sets in the flat. A complete statement of the results of these six sets is given in the following table:—

MANURE EXPERIMENTS, CENTRAL EXPERIMENT FARM, 1902-3.

MAIZE, ON HILL SOIL (RED LOAM).

Set A.—Superphosphate Section.

Variety: Horse Tooth. Sown, 25th Nov., 1902; harvested, 29th June, 1903; shelled, 4th Aug., 1903.

		SHELLED GRAIN. PER ACRE.			STALKS, CORES, AND REFUSE GRAIN. PER ACRE.		
		Total Yield.		Gain due to Manure. lbs.	Total Yield.		Gain due to Manure. lbs.
		With Manure. lbs.	Without Manure. lbs.		With Manure. lbs.	Without Manure. lbs.	
Border Plot	No manure	...	490	...	...	1,810	...
Plot 1	N.P.K.l.	1,140	383	757	2,730	1,713	1,017
" 2	No manure	...	370	...	...	1,680	...
" 3	N.P.K.m.	1,540	356	1,184	2,820	1,647	1,173
" 4	N.P.K.h.	1,700	343	1,357	2,980	1,613	1,367
" 5	No manure	...	330	...	...	1,580	...
" 6	—P.K.m.	1,590	343	1,247	2,520	1,647	873
" 7	N. K.m.	290	356	(66 loss)	1,950	1,713	237
" 8	No manure	...	370	...	...	1,780	...
" 9	N.P.—m.	1,300	366	934	2,780	1,737	1,043
" 10	—P.—m.	1,140	363	777	2,250	1,693	557
" 11	No manure	...	360	...	...	1,650	...
" 12	—P.—m.	1,150	373	677	2,170	1,693	477
" 13	—B.—m.	980	386	594	2,130	1,737	393
" 14	No manure	...	400	...	...	1,780	...
" 15	—L.	400	390	10	1,790	1,770	20
" 16	N.P.K.m. L.	1,180	380	800	3,070	1,760	1,310
" 17	No manure	...	370	...	...	1,750	...
" 18	—P.—m. L.	1,160	360	800	2,150	1,755	295
Border Plot	No manure	...	350	...	...	1,700	...

Set B—Slag Section.

Variety: Golden Beauty. Sown, 27th Nov., 1902; harvested, 1st July, 1903; shelled, 5th August, 1903

Border Plot	No manure	...	530	...	...	1,380	...
Plot 1	N.P.K.l	900	540	360	1,660	1,375	285
" 2	No manure	...	550	...	...	1,370	...
" 3	N.P.K.m.	1,180	554	626	2,010	1,370	640
" 4	N.P.K.h.	1,260	558	702	2,290	1,370	920
" 5	No manure	...	562	...	...	1,370	...
" 6	—P.K.m.	980	551	429	1,670	1,380	290
" 7	N.—K.m.	320	539	(219 loss)	1,160	1,390	(230 loss)
" 8	No manure	...	528	...	...	1,400	...
" 9	N.P.—m.	1,190	498	692	1,820	1,330	487
" 10	—P.—m.	1,070	467	603	1,510	1,267	243
" 11	No manure	...	437	...	...	1,200	...
" 12	—P.—m.	1,190	436	764	1,580	1,203	377
" 13	—B.—m.	1,120	434	686	1,550	1,207	343
" 14	No manure	...	433	...	...	1,210	...
" 15	—L.	510	414	96	1,270	1,183	87
" 16	N.P.K.m. L.	1,350	396	954	2,010	1,157	853
" 17	No manure	...	377	...	...	1,130	...
" 18	—P.—m. L.	1,200	373	827	1,680	1,103	577
Border Plot	No manure	...	310	...	...	960	...

MANURE EXPERIMENTS, CENTRAL EXPERIMENTAL FARM, 1912-3 (Continued).

Set C. Superphosphate Section.

Variety : Hickory King. Sown, 28th Nov., 1902 ; harvested, 6th June, 1903 ; shelled, 26th June, 1903

Border Plot	...	No manure	...	509	...	...	1,420	...
Plot 1	...	N.P.K.m.	1,300	494	806	2,170	1,370	800
" 2	...	No manure	...	479	...	...	1,320	...
" 3	...	N.P.—m	1,291	448	843	2,040	1,297	743
" 4	...	—P.—m.	1,407	417	990	1,560	1,274	286
" 5	...	No manure	...	386	...	...	1,250	...
" 6	...	—P. m.	1,320	362	958	1,550	1,265	285
Border Plot	...	No manure	...	339	...	...	1,280	...

Set B.—Slag Section.

Variety : Hickory King. Sown, 28th Nov., 1902 , harvested, 6 h June, 1903 ; shelled, 26th June, 1903

Border Plot	...	No manure	...	421	...	...	1,280	...
Plot 1	...	N.P.K.m.	960	405	555	1,260	1,260	Nil
" 2	...	No manure	...	388	...	...	1,240	...
" 3	...	N.P.—m.	887	400	487	1,080	1,250	(17 loss)
" 4	...	—P.—m.	813	412	401	1,440	1,260	180
" 5	...	No manure	...	423	...	...	1,270	...
" 6	...	—P.—m.	1,061	370	691	1,560	1,220	340
Border Plot	...	No manure	...	317	...	...	1,170	...

MAIZE, ON RIVER FLAT (VLEI) SOIL (DARK GREY CLAY LOAM)

Set E.—Superphosphate Section.

Variety : 8-Row Yellow. Sown, 1st Dec. 1902 , harvested, 4th June, 1903 ; shelled, 27th June, 1903.

Border Plot	...	No manure	...	800	...	...	2,320	...
Plot 1	...	N.P.K.m.	1,087	753	331	2,880	2,170	710
" 2	...	No manure	...	701	...	...	2,020	...
" 3	...	N.P.—m.	1,185	674	511	3,190	1,923	1,267
" 4	...	P. m.	1,075	641	434	2,400	1,826	574
" 5	...	No manure	...	600	...	...	1,730	...
" 6	...	—P.—m.	1,040	704	306	2,380	2,025	355
Border Plot	...	No manure	...	800	...	...	2,320	...

Set F.—Slag Section.

Variety :—Ladysmith. Sown, 1st Dec., 1902 ; harvested, 5th July, 1903 ; shelled, 6th August, 1903.

Border Plot	...	No manure	...	761	...	...	2,220	...
Plot 1	...	N.P.K.m.	990	725	265	3,160	2,220	940
" 2	...	No manure	...	901	...	...	2,220	...
" 3	...	N.P.—m.	970	655	315	2,820	2,130	690
" 4	...	—P.—m.	970	620	350	2,820	2,040	480
" 5	...	No manure	...	555	...	...	1,950	...
" 6	...	P.—m	1,190	620	570	2,550	1,985	565
Border Plot	...	No manure	...	710	...	...	2,020	...

EXPLANATIONS :

N means Sulphate of Ammonia.

N " Nitrate of Soda.

P " Superphosphate.

P " Basic Slag.

B " Bone Dust.

K " Potash Chloride.

l " Light Dressing.

m " Medium Dressing (twice as much as l).

h " Heavy Dressing (three times as much as l).

L " 10 cwt. per acre Lime.

The Light Dressings were:—

Sulphate of Ammonia, 85 lbs. per acre.

Nitrate of Soda ... 112 " "

Superphosphate ... 150 " "

Basic Slag ... 150 " "

Bone Dust ... 150 " "

Potash Chloride ... 50 " "

Various points are brought out by these experiments. The principal points are the comparative effect of light and heavy dressings, of complete and incomplete manures, of different kinds of phosphates, the effect of lime, the varying effect of different manures on the proportion between straw and grain, and the difference between the hill soil and the flat soil. Of course, one season's experiments cannot be taken as giving final results on these various points; nor can the effect of manures on the experiment farm be taken as a complete guide for all the soils of the Colony; but there are, no doubt, many soils in Natal similar to those of the experiment farm, and the results obtained there may be taken in a general way as a guide in a large number of cases.

EFFECT OF LIGHT AND HEAVY DRESSINGS.

In my numerous experiments in Australia, it was almost invariably found that the lightest dressings of manure gave the largest profit on the outlay for manure, and that heavier dressings gave profits in a constantly decreasing proportion. Thus, if a light dressing yielded a profit of 200 per cent. on the outlay, twice that dressing might give a profit of only 140 per cent., and three times that dressing might give a profit of only 96 per cent. Where such results are obtained, it might, on first thought, appear the best policy to use the lightest dressings of manure. But this by no means follows, for the farmer has to consider the profit, not only on the outlay for manure, but on the total cost of

growing the crop. Thus, with an expenditure of 20s. in manure, a crop worth 100s. might be obtained; but the total cost of obtaining that crop might be 80s., leaving a profit of 20s., or 25 per cent. on the total outlay. But with the expenditure of 40s. in manure, a crop might be obtained worth 136s., and if the total expenses amounted to 105s., the net profit of the crop would be 31s., or 30 per cent. on the total outlay. If, again, 60s. were spent in manure, the crop might be worth 158s., and if the total expenses amounted to 128s., there would be a profit of 30s., or about 23½ per cent. on the total outlay. In such a case the profits on the total outlay would be:

With a light dressing of manure ...	25 per cent.
" medium " ...	30 "
" heavy " ...	23½ "

Clearly, then, the medium dressing would, under such conditions, result in the greatest profit. The total expenses of growing a crop vary according to difficulty of working the soil, price and efficiency of labour, distance from market, efficiency of management, and so on, and must be calculated by each individual farmer for himself. In Australia, farmers generally found it the best policy to use a medium dressing of manure, while those who had the capital to spare often found that they could not invest it to better advantage than in heavy dressings of manure.

The tests of the effect of light and heavy dressings in the above experiments were made on Plots 1, 3, and 4 of Set A and Set B. The results, stated concisely, were as follow:—

TABLE SHOWING INCREASES OF CROP PER ACRE DUE TO LIGHT AND HEAVY DRESSINGS OF MANURES.

	Light Dressing.	Medium Dressing. (Twice as much as Light Dressing.)	Heavy Dressing. (Three times as much as Light Dressing.)
Set A.—Super. Section, Horsetooth ...	757 lbs.	1,184 lbs.	1 357 lbs.
Set B.—Slag Section, Golden Beauty ...	360 lbs.	626 lbs.	702 lbs.
Average ...	558 lbs.	905 lbs.	1,029 lbs.
Grain.	1st measure.	2nd (additional) measure.	3rd (additional) measure.
	Gain due to each measure of Manure ...	558 lbs.	347 lbs.
			124 lbs.

Straw and Refuse.	Set A.—Super. Section, Horsetooth	...	1,017 lbs.	1,173 lbs.	1,367 lbs.
	Set B.—Slag Section, Golden Beauty	...	285 lbs.	640 lbs.	920 lbs.
	Average	...	651 lbs.	906 lbs.	1,143 lbs.
	Gain due to each measure of Manure	...	651 lbs.	255 lbs.	237 lbs.
Grain and Straw together.	Set A.—Super. Section, Horsetooth	...	1,774 lbs.	2,357 lbs.	2,624 lbs.
	Set B.—Slag Section, Golden Beauty	...	645 lbs.	1,266 lbs.	1,622 lbs.
	Average	...	1,210 lbs.	1,812 lbs.	2,173 lbs.
	Gain due to each measure of Manure	...	1,210 lbs.	602 lbs.	361 lbs.

The figures in the last line of the above table are the simplest, and they are interesting as confirming results to which I have already alluded, namely, that heavy dressings give a constantly decreasing proportion of crop. Thus, the first measure of manure, the light dressing (which weighed about 300 lbs. per acre), produced a total increase of crop amounting to 1,210 lbs. But when another 300 lbs. of manure were added to the first 300 lbs., in order to make up the medium dressing, that additional 300 lbs. gave only 602 lbs. of crop, or just half of what the first did; and when still another 300 lbs. was added to this to make up the heavy dressing, it yielded only 361 lbs. of crop, or about half of what the second 300 lbs. yielded.

The figures in the last line, however, refer to the gain in the total crop, grain and straw together. If we refer to yield of grain only, which for general purposes is the more important, we find that in both the superphosphate and the slag sections, the results were more favourable to the medium dressing of manure. The light dressing of the superphosphate mixture, weighing about 300 lbs., produced an increase of 757 lbs. of grain; the medium dressing (about 600 lbs.), produced an increase of 1,184 lbs. of grain, so that the second 300 lbs. of manure in this dressing produced 427 lbs. of grain, or 56 per cent. of what the first 300 lbs. produced; while the heavy dressing (about 900 lbs.), produced only 1,357 lbs. of grain, or 163 lbs. more than the medium dressing produced, so that

the third 300 lbs. in this dressing produced only 38 per cent. of what the second 300 lbs. produced. In the slag section the superiority of the medium dressing was still more pronounced; the second 300 lbs. in the medium dressing producing 71 per cent. of what the first 300 lbs. produced; and the third 300 lbs. in the heavy dressing producing only 28½ of what the second 300 lbs. produced. It is not unlikely that in a more favourable season the heavier dressings would have had a better proportional effect. It is not a little interesting that in the dry season prevailing during the experiment, the effect on the leaves and stem of the quick-acting superphosphate was caused almost entirely by the light dressing, the further additions of manure in the medium and heavy dressings having caused only trifling increases in the straw.

EFFECT OF COMPLETE AND INCOMPLETE MANURES.

We have now to consider which of the constituents in the complete mixtures used on plots 1, 3 and 4 was most concerned in producing the increases of crop. The complete mixtures contained three principal constituents, namely, nitrogen, phosphoric acid and potash. In Set A, the nitrogen was given in the form of sulphate of ammonia, 85 lbs. per acre being the light dressing; the phosphoric acid was given in the form of ordinary superphosphate, 150 lbs. per acre being the light dressing; and the

potash was given in the form of potash chloride, 50 lbs. per acre being the light dressing. In Set B, the nitrogen was given in the form of nitrate of soda, 112 lbs. per acre being the light dressing, the phosphoric acid was given in the form of basic slag, 150 lbs. per acre being the light dressing; and the potash was given as potash chloride, 50 lbs. per acre being the light dressing.

The effect of these various constituents is shown by comparing the results obtained on plot 3, the medium dressing in each set, with the corresponding plots 6, 7 and 9. The nitrogen was left out of the manure given to plot 6, and if the soil contained sufficient nitrogen, the

manure on this plot should have produced the same result as the manure on plot 3. Similarly, the effect of phosphoric acid was shown by comparing plot 7 with plot 3, and the effect of the potash was shown by comparing plot 9 with plot 3. In regard to phosphoric acid, confirmatory evidence was obtained on plots 10 and 12, which received superphosphate alone and slag alone. It will facilitate reference if it be borne in mind that sulphate of ammonia is represented by the letter *N*, nitrate of soda by *N*, superphosphate by *P*, basic slag by *P*, and potash salt by *K*.

The results obtained on these various plots is shown concisely in the following table:—

TABLE SHOWING INCREASE OF CROP PER ACRE DUE TO COMPLETE AND INCOMPLETE MANURES.

		ON THE HILL SOIL.					
		Plots 3. <i>N.P.K.</i> <i>N.P.K.</i>	Plots 6. <i>- .P.K.</i> <i>— .P.K.</i>	Plots 7. <i>N—K.</i> <i>N.—K.</i>	Plot 9. <i>N.P.—</i> <i>N.P.—</i>	Plots 10. <i>— .P.—</i> <i>— .P.—</i>	Plots 12 <i>— .P.—</i> <i>— .P.—</i>
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Grain.	Set A.	1,184	1,247	(66 loss)	934	777	677
	Set B.	626	429	(219 loss)	692	603	764
		—	—	—	—	—	—
	Average	905	838	(142 loss)	813	690	720
Straw and Refuse.	Set A.	1,173	873	237	1,043	557	477
	Set B.	640	290	(230 loss)	487	243	377
		—	—	—	—	—	—
	Average	906	581	3	765	400	427

EFFECT OF PHOSPHATE ON THE HILL SOIL.

The most striking fact in the above table is the disastrous result consequent on leaving out the phosphoric acid from plot 7. The result is less than if no manure at all had been used. The absolute need of phosphoric acid is thus shown in a most forcible manner. The results gained on plots 10 and 12 show also that the phosphoric acid was the constituent most concerned in producing the increase of grain, in fact in Set B the result obtained with the phosphatic manure alone on plot 10 was practically equal to that obtained with the complete mixture on plot 3. The comparative effect of the phosphatic manure alone

(plot 10) in Set A was not so great; and there is evidence to show that the large stemmed horse-tooth maize has a greater need of both nitrogen and potash than the smaller stemmed varieties of maize have.

EFFECT OF NITROGEN ON THE HILL SOIL.

The effect of nitrogen was most apparent on the straw. The average gain of grain on plot 3, with nitrogen, was 905 lbs.; and the average on plot 6, without nitrogen, was 838, or $7\frac{1}{2}$ per cent. less; while on the same plots the average gain of straw and refuse, with and without nitrogen, was 960 lbs. and 581 lbs. respectively, or 36 per cent. less without nitrogen than

with. A similar result comes out on comparison of plots 9 with plots 10 and 12; the average gain of grain on plots 9, with nitrogen, being 813 lbs., and the average on plots 10 and 12, without nitrogen, 705 lbs., or 13 per cent. less; while the average gain of straw, with nitrogen, was 765 lbs., and without nitrogen only 413 lbs., or 46 per cent. less.

A somewhat similar result came out in the small Sets C and D. The average gain of grain on plots 4 and 6, without nitrogen, of these sets was, indeed, greater than on plots 3, with nitrogen; but in Set C the gain of straw on plots 3, with nitrogen, was 743 lbs., whilst on plots 4 and 6, without nitrogen, it was only 285½ lbs. In Set D this effect on the straw was indeed reversed, there having been less with nitrogen than without. But this was an irregularity probably due to the fact that the Hickory King seed used on these plots seemed to be specially sensitive to contact with nitrate of soda. The germination was retarded several days by this contact, and the crops seemed never to wholly recover from this injurious effect. In fact all through the experiments, not only with maize, but with the other cereals also, it was found that both nitrogen and potash salts, when placed near the seed, retarded germination.

The application of fertilizers in the drills with the seed is the simplest and least costly of all methods, but this retarding effect on germination, when nitrogen and potash salts are used, may result in its being not the most profitable. During the present season a series of experiments is being conducted for the purpose of ascertaining the most profitable method of applying manures; some will be given in drills with the seed in the ordinary way, some will be given in drills in advance of the seed, and covered with soil before the seed is sown, some will be broad casted and both harrowed

in and ploughed in, and some will be partly broadcasted and partly in drills.

Taking the average of the four plots on the hill soil, which received nitrogen and phosphoric acid, and of the six corresponding plots which received phosphoric acid only, the results came out as follows:—

GAIN PER ACRE DUE TO—

	Nitrogen and Phosphoric Acid. (Average of 4 Plots.)	Phosphoric Acid only. (Average of 6 Plots.)
Grain	739 lbs.	725 lbs.
Straw and Refuse	526 lbs.	339 lbs.

From the above results we should conclude that for grain production the hill soil is not in much need of nitrogen at present; but the marked improvement caused by nitrogen manuring on the straw shows that the soil is deficient in nitrogen, and this deficiency may be expected in a year or two to show its effect on grain production also. The most economical way of supplying nitrogen will probably be found, not in the application of sulphate of ammonia or nitrate of soda, but in the growth of leguminous crops in rotation with, or in conjunction with, the maize crop. In order to find out the best practical method of doing this, an extensive set of rotation experiments is being commenced on the farm this season.

EFFECT OF POTASH ON THE HILL SOIL.

The effect of potash is to be seen in Sets A and B on comparing plots 3 and 6 with plots 9 and 10 respectively, and in Sets C and D on comparing plots 1 with plots 3. The results may be concisely set out as follows:—

GAIN OF CROP PER ACRE DUE TO MANURES WITH AND WITHOUT POTASH.

	GRAIN.			STRAW AND REFUSE.	
	With Potash.	Without Potash.		With Potash.	Without Potash.
Set A, Plots 3 and 9 ...	1,184 lbs.	934 lbs.	} Considerably better with Potash.	1,173 lbs.	1,043 lbs.
Set D, Plots 1 and 3 ...	555 lbs.	487 lbs.		Nil	(170 lbs. loss)
Set A, Plots 6 and 10 ...	1,247 lbs.	777 lbs.		873 lbs.	557 lbs.
Set B, Plots 3 and 9 ...	626 lbs.	692 lbs.	} A little better without Potash.	640 lbs.	487 lbs.
Set C, Plots 1 and 3 ...	806 lbs.	843 lbs.		800 lbs.	743 lbs.
Set B, Plots 6 and 10 ...	429 lbs.	603 lbs.	} Considerably better without Potash.	290 lbs.	243 lbs.
Averages ...	808 lbs.	723 lbs.		629 lbs.	484 lbs.

All better with Potash.

From the above figures it will be seen that there was no case in which the straw was not better with potash than without; and taking the average of the six pairs of test plots, the gain of straw with potash was 629 lbs. per acre, whilst without potash it was only 484 lbs., or 23 per cent. less than with potash. In regard to grain, the results were less uniform; in three cases the yield was considerably better with potash than without, in two it was a little better without potash than with, and in one it was much better without potash than with. This last result was in all probability due to the injurious effect already referred to of potash salts in retarding the germination of seed when in contact with it. On the average there was 10 per cent. less gain of grain without potash than with.

It is clear from the above results that this soil is in need of potash for maize growing. It remains to be ascertained, how this may be most economically and profitably applied. At present I should be inclined to recommend the use of 50 lbs. per acre of potash chloride.

COMPARISON OF HILL AND VLEI SOILS.

The difference in the productive capacity of the hill and vlel soils may be clearly seen on comparing the yields of the unmanured plots and of the corresponding manured plots on each. These are shown in the following comparative statement:—

COMPARATIVE YIELDS PER ACRE OF HILL AND VLEI SOILS.

	Hill.		Vlei.	
	Grain. Lbs.	Straw, etc. Lbs.	Grain. Lbs.	Straw, etc. Lbs.
Average of all Unmanured Plots ...	416	1,386	707	2,100
Average of all corresponding Manured Plots ...	1,168	1,850	1,063	2,737
Average gain due to Manure ...	752	475	356	637



Plot 5 Unmanured.

Plot 4. Manured.
Heavy Dressing.

Fig. 1 Six weeks after sowing.



Plot 3.
Medium Dressing.

Plot 4.
Heavy Dressing.

Plot 5.
No Manure.

Plot 6.
Without Nitrogen

Fig. 2. Same crop as Fig. 1, 4½ months after sowing.

MAIZE MANURE PLOTS AT THE NATAL CENTRAL EXPERIMENT FARM

The unmanured plots showed that the vleï was naturally more productive than the hill, but not very much so as regards grain, the tendency being to produce an excessive amount of straw; while the manured plots showed that the hill soil responded much more in grain production than did the vleï soil, and considerably less in straw. Judging from these results, and bearing in mind also the

ease with which the hill soil can be got into order and worked, one would be inclined to consider the hill soil the more valuable of the two; though, of course, one cannot form a final decision from only one season's experience.

As to the effect of the different manurial constituents on the vleï soil this is shown in the following concise statement:—

INCREASES OF CROP PER ACRE DUE TO MANURING THE VLEI SOIL.

				Plots 1. <i>N.P.K.</i> <i>N.P.K.</i> Lbs.	Plots 3. <i>N.P.</i> — <i>N.P.</i> — Lbs.	Plots 4. — <i>P.</i> — — <i>P.</i> — Lbs.	Plots 6. — <i>P.</i> — — <i>P.</i> — Lbs.
Grain.	{	Set E.—8-Row Yellow	...	334	511	434	306
		Set F.—Ladysmith	..	265	315	350	570
		Average	...	300	413	392	436
						414	
Straw and Refuse.	{	Set E. 8-Row Yellow	..	710	1,267	574	355
		Set F.—Ladysmith	.	940	690	480	565
		Average	...	825	978	527	460
						493	

That the chief need of this soil for grain production is phosphoric acid is shown by the fact that the yield was just as good with the phosphoric acid used by itself as when used in conjunction with the other constituents. The effect of the nitrogen was simply to increase the straw; but as the tendency of the soil was naturally to produce straw, the effect of nitrogen was not necessary, and, indeed, was rather to be deprecated. The potash salt had no other effect on the weight of crop than to diminish the effect of the phosphoric acid.

COMPARATIVE EFFECT OF DIFFERENT PHOSPHATIC MANURES.

The different phosphatic manures employed in the experiments were, (a) ordinary superphosphate, containing a total of 18.34 per cent. phosphoric acid, of which 17.11 was water soluble, and costing £7 5s. per long ton, landed at the farm; (b) basic slag, otherwise known as Thomas phosphate, containing a total of 21.63 per cent. phosphoric acid, of which 10.01 was citrate soluble, and costing

£4 17s. 6d., landed at the farm; and (c), bonedust, containing 25.43 per cent. total phosphoric acid, of which 3.62 was citrate soluble, and containing also 3.70 per cent. nitrogen, and costing £7 7s. 9d., landed at the farm. As the experiments showed that phosphoric acid was the most needed of all the manurial constituents, it is of prime importance to ascertain the cheapest source of this substance. We have then to make a careful comparison of their effects; and it will be most convenient to compare first the effects of superphosphate and slag.

COMPARISON OF SUPERPHOSPHATE AND SLAG.

There were thirteen pairs of plots in the maize manure experiments which received superphosphate and slag for comparative purposes; nine of these were on the hill and four on the flat; six received the phosphatic manures alone, and seven received the phosphatic manures in conjunction with nitrogen or potash manures, or both. The following table gives a complete summary of the results:—

TABLE SHOWING COMPARATIVE EFFECT OF SUPERPHOSPHATE AND SLAG.

		Superphosphate.			Slag.			Taking the effect of Superphosphate as 100, the effect of Slag was:	
		Plot.	Grain. Lbs.	Straw, etc. Lbs.	Plot.	Grain. Lbs.	Straw, etc. Lbs.	Grain.	Straw, &c.
Used Alone.	Hill.	10a	777	557	12a	677	477	...	...
		12b	764	377	10b	603	243	...	...
		4c	990	286	6c	958	285	...	...
		6d	691	340	4d	401	180	...	...
		Averages	805	390		660	296	82.0	76.0
	Flat.	4e	434	574	6e	306	355	...	...
		6f	570	565	4f	350	480	...	...
		Averages	502	570		328	418	65.3	73.3
	Hill.	9a	934	1,043	9b	692	487	...	...
		3c	843	743	3d	487	(170 lbs)	...	...
		Averages	888	893		590	158	66.5	17.7
Used with Nitrogen Salts.	Flat.	3e	511	1,267	3f	315	690	61.6	54.5
Used with Potash Salt.	Hill.	6a	1,247	873	6b	429	290	34.4	33.2
Used with Nitrogen and Potash Salts.	Hill.	3a	1,184	1,173	3b	626	640	...	...
		1c	806	800	1d	555	nil	...	...
		Averages	995	986	...	590	320	59.3	32.4
	Flat.	1e	334	710	1f	265	940	79.3	132.4
General Average on Hill (excluding the Potash Mixture)		...	874	665	...	625	268	71.5	40.3
General Average on Flat		...	462	779	...	309	616	66.9	79.1
General Average of the 13 Tests		...	776	613	...	513	376	66.1	61.3

From the above table it will be seen that although the comparative effects of superphosphate and slag were by no means uniform, yet superphosphate in all cases, save in one case of yield of straw, gave a superior result to that given by an

equal weight of slag. The average of all the thirteen tests showed that as regards increase of grain, the slag was only 66 per cent. as effective as superphosphate, and as regards straw, only 61 per cent. as effective.

The slag had a higher comparative effect on grain production, and a lower comparative effect on straw production on the hill soil than on the flat; and it had a better comparative effect when used alone than when used in conjunction with nitrogen or potash, or both. Taking the effect of superphosphate as 100, then the effect of slag, when used alone, was 76.6 on the grain, and 74.9 on the straw; while, when used in conjunction with nitrogen, its effect was only 65.3 on the grain, and 33 on the straw, and when used in conjunction with nitrogen and potash, its effect was 65.6 on the grain, and 59 on the straw.

It will be remembered that in the potato experiments, described in the 10th July 1903 number of this *Journal*, the comparative effects of superphosphate and slag on the yield of tubers were as 100 to 69.3. The results on the maize plots agree very well with this: the general effectiveness of the slag on the maize plots was 66 per cent. of that of the superphosphate: in other words, the slag in the first season was worth only 66 per cent. of the superphosphate. Now the superphosphate costs 115s. per ton on the farm, and the slag, reckoned on the basis of its first season's effect, should have cost 66 per cent. of 115s., namely, 95s. 9d. It actually cost 97s. 6d. So that at Natal prices it was being sold at a proper valuation, as compared with the ordinary superphosphate on the Natal market. But, as I have on previous occasions explained, the ordinary superphosphate at Natal prices is not the cheapest. The cheapest is the "concentrated" or so-called "double" superphosphate, containing 46½ per cent. of phosphoric acid, mostly water soluble. I have used this material for many years, and have found by careful tests that 1 lb. of phosphoric acid contained in it has the same practical effect as 1 lb. of phosphoric acid contained in the ordinary superphosphate. Last year a private

farmer imported some on my recommendation. It cost him £11 17s. per long ton, landed at Durban; and would at that rate cost £12 7s. landed at the Experiment Farm. I have recently seen an offer to land it at Delagoa Bay in large quantities at less than £10 per long ton. This material is, I am informed, being stocked at Durban for sale at £15 per long ton, and could therefore be landed at the farm at £15 10s. At this price, £6 5s. worth of it would in the first season produce the same effect as £7 5s. of the ordinary superphosphate, and as £7 12s. worth of slag at last year's Natal prices. In order to compete with it, ordinary superphosphate would have to be sold in Durban at £6 1s. per long ton, and slag would have to be sold at £4 7s. 4d. per long ton. And even at such prices this material would have a considerable advantage for conveyance to distance from Durban, consequent on the saving in railway freight and cartage, owing to its small bulk. It is obvious, however, that the cheapest way of obtaining this concentrated superphosphate is to import it direct.

Taken at present Natal prices of ordinary superphosphate and slag, the slag would have been the less profitable manure to use on the vleis soil, or on the hill soil, in conjunction with nitrogen and potash salts. But used by itself on the maize crop on the hill soil in sufficient quantity it would have been a little more profitable in grain production than the superphosphate, but 366 lbs. of slag per acre would have been required to produce the same effect as 300 lbs. of superphosphate.

COMPARATIVE EFFECT OF SUPER- SLAG AND BONE-DUST.

There were two sets of three plots each, on which these three manures were tested side by side: these were plots 10, 12 and 13 of Sets A and B. The gain of crop in each case was as follows:—

COMPARISON OF SUPERPHOSPHATE, SLAG AND BONE DUST.

Superphosphate.				Slag.				Bone Dust.			
		Grain.		Straw, &c.				Grain.		Straw, &c.	
10a	777	557		12a	677	477		13a	594	393	
12b	764	377		10b	603	243		13b	686	343	
Average	...	770	467		640	360			640	368	
Taking effect of Superphosphate as 100				...	83	77.1		83	78.8		

It will be seen from the above that the effect of the bonedust was exactly the same as that of the slag. To be worth buying, bonedust ought, therefore, to be purchaseable at the same price as slag, namely, at £4 7s. per long ton, instead of £6 16s. Bonedust is at the present day existing to a great extent on the reputation it gained many years ago, before the introduction of superphosphate and slag. It is a valuable manure, just as slag is; but it is not so valuable as it is generally reckoned to be.

EFFECT OF LIME.

Lime, as applied in the experiments, had a slight beneficial effect during the first season when used alone or in conjunction with superphosphate; but from plot 18 A on which it was used in conjunction with a complete superphosphate mixture, the yield of grain was less than from plot 3 A, on which the same mixture was used without lime. The beneficial effect where it occurred was too small to be worth consideration.

GENERAL CONCLUSIONS.

We have seen that on the hill soil 300 lbs. per acre of superphosphate produced on the average of four tests 805 lbs. of maize grain. The cost of the superphosphate at last year's prices was 21s.

9d. The value of the increase of grain at 15s. a muid would have been 60s.; the profit on the outlay for manure having been thus 176 per cent. But had the manure been purchased in the cheapest market, we have seen it would have cost only 13s. 3d. per acre, so that the profit on the outlay for manure would have been 46s. 9d., or 353 per cent.

But we have seen also that potash is necessary for this hill soil, and although it is not possible at present to state definitely the quantity needed, there is reason to suppose that 50 lbs. per acre used in conjunction with the 120 lbs. of conc. superphosphate, and costing 6s. 3d. on the farm, would have yielded an increase of grain amounting to 228 lbs., which, at 15s. per muid, would have been worth 17s., or a profit of 172 per cent.

Thus, by a total expenditure of 19s. 6d. on this hill soil—a soil which was originally deemed worthless for crop growing—an increase in crop worth 77s. would have been obtained, and that in a season which the old Natalian farmers stated was one of the worst known in Natal for many years.

From these facts we may surmise that these experiments contain the germ of what may grow to be a very large and profitable business, a business which will have a considerable effect on the development of Natal.

Passing Notes.

TULIP.—How pests of all kinds are disseminated through the world in these days of rapid intercourse is exemplified by the appearance of the obnoxious South African tulip (*Homeria* sp.) in various parts of Australia. It was first

noticed at Melbourne in 1892. In South Australia it is now said to be spreading far and wide. In the last *Journal of Agriculture* of that Colony a case is reported of 22 head of cattle having succumbed to its poisonous effects.

and the statement is made that in those parts where tulip is common the value of land has fallen considerably in value. Efforts have been made to get legislation from various Australasian Parliaments for the eradication of the weed, but without success. As a single plant has often five hundred bulbs, which germinate very readily, general extirpation would now be a matter of huge difficulty.

WEEVILS.—The *Queenland Agriculturist* states that mealies stored in salt bags, or together with salt, will not be attacked by the weevil. The plan recommended is simple, and should be worth a trial.

BUYING CANE.—Arator, in the *Natal Advertiser*, writes that he understands the Tongaat Sugar Company have adopted the system of purchasing planters' cane by the weight. He remarks:—"This system has the advantage of letting the planter see exactly how he stands day by day. He sells his cane to the company at so much a ton, and there is an end of it as far as he is concerned." In connection with the foregoing, we reproduce the following from the description by Ergates of the opening of Messrs. Hulett & Son's sugar mill, No. 14, Vol. VI.:—"A question which is always of interest to Natal planters who supply mills, is that of the system of payment. On this subject I had some conversation with Mr. Smith, and, as he has had long experience, his opinion should be of value. He said that in most parts of the world the cane is bought without reference to the sugar contents of the daily deliveries. This plan was found to give the least misunderstanding and trouble, and to be of the most satisfactory for the planter and the miller. In the West Indies the cane varies considerably during the crushing season in the richness of the juice; still, under arranged prices, both parties were satisfied. The testings in actual practice, while general milling was going on, were delusive. Buying the cane subject to a sliding scale on the monthly fluctuations in the price of sugar can be easily arranged, and is the best commercial basis."

WARRANTY.—Scotch Courts hold that an advertisement is a warranty.

This is the finding of a recent action concerning a cob. The animal was advertised for sale as sound and free from vice. It was applied for on that footing, and although the intending purchaser had a trial of the animal, and saw no signs of vice on the trial, yet on completion of the deal, and in daily work, it proved a bad one, with certain vicious propensities. The purchaser, basing his case on the advertisement, claimed restitution of the money and the annulling of the bargain. To this the seller refused to accede. She pleaded that the advertisement was not a warranty, but only the expression of a belief. The Court held otherwise. The statement in the advertisements were part of the material of the bargain. But for them it would never have been spoken of, and therefore the buyer was influenced by what he read in the advertisement. On this ground the buyer won the case, and a good many will hold that the decision was right.

DRAIN PIPES.—Mr. Allan Stuart in his letter on drain pipes, which will be found elsewhere, raises an interesting question—that of underground drainage in connection with irrigation. On some stiff soils irrigation is useless, or rather worse than useless, if drainage is neglected. Mr. Stuart is not quite correct in his supposition that drain pipes are unprocurable in the Colony. Mr. A. Oliff, of whom inquiry was made, can supply a limited quantity; the prices, delivered to the railway, are: for 2 inch diameter, £6 6s. per 1,000, and for 3 inch, £9 9s. per 1,000. The pipes are one foot in length. In England drainage authorities do not approve of a smaller diameter than 2½ inches. The prices, compared with those of England, are somewhat high, they exceed the "twice as much" which one expects to pay for most things in the Colony. In England, the nearer to coalfields the cheaper they are. Brickmaking yards along the railway are extending up country, and, if inducement should offer, would doubtless meet the demand. Where small stones are easily procurable excellent underground drains may be made. With such stones the writer of this note drained a snipe swamp, and

although the drains were made more than twenty years ago, they are still as effective as ever. Big bamboos cut in sections are said to last for a very long time, and to serve their purpose capably; one advantage is the lightness in handling them. Brushwood and reeds also make good drains, but of course, not of a very permanent character. Nothing, however, compares with good hard drain pipes, and as time goes on they will doubtless be procurable in quantity at moderate prices.

AGAINST MOSQUITOS.—Mr. J. Medley Wood, A.L.S., in his recently issued Part I., Vol. IV. of *Natal Plants*, describes the *Ocimum sauve*, Willd., a plant which is accredited with powers that keep mosquitos at a distance. It is a much branched perennial undershrub, 18 inches to 4 feet high, bearing numerous white flowers, which are sometimes tinged with pink. Of the genus, Mr. Wood says, that there are about 60 species. He remarks:—“One species, *O. viride*, a native of tropical Africa and Asia, has lately come into notice on account of its supposed value in repelling mosquitoes, and it is possible that the plant here described

(*O. sauve*) may have similar qualities. The whole plant is thickly gland-dotted and powerfully scented even when dry. . . . The natives use it for perfumery, and call it u-Qabukulu.” Since Mr. Wood wrote the foregoing, the flowers of the shrub have been put to the test by a Durban resident who suffered every night from attacks of mosquitos. Three small muslin bags, about 4 inches square, filled with the flowers of this plant, he hung about his bed, and he affirms that not a mosquito has visited him since beginning the experiment. His statement is worthy of credence, for he is not one to allow enthusiasm to bias judgment. The recipe is simple and worth trying by those who are troubled by mosquitos, those winged and sometimes poison-laden pests of the night. To substitute mosquito curtains by two or three little bags containing scented flowers should be a big boon in many ways. Mr. Wood refers to specimens gathered near Durban at 500 feet altitude, and at Eshowe 1,500 feet altitude. The plant is familiar to most Natal natives; about Maritzburg it is known to grow on Table Mountain.

Rhodesian Redwater.

VIEWS OF THE GOVERNMENT BACTERIOLOGIST AND GOVERNMENT ENTOMOLOGIST.

THE MINISTER OF AGRICULTURE addressed the following queries to the Government Bacteriologist and the Government Entomologist on the subject of Mr. Alexander's contribution which appeared in the *Natal Witness* of the 26th ulto. :—

1. Is there any recorded instance of game contracting the disease?
2. Would the infected tick maturing on game transmit the disease.
3. What are the shortest and the longest periods at which outbreaks might occur from “dropped” ticks?

The Government Bacteriologist (Mr. H. Watkins-Pitchford) replied as follows :—

Both articles are of value in suggesting the frequent use of dipping as a check to

the progress of the disease. There seems to be no reason to doubt that, if the cattle surrounding an outbreak of the disease are kept tick-free, no opportunity will be given for the natural spread of the disease. The risk, at any rate, will be reduced to a minimum. As to the practicability of movable dips for use by the Department, I have no experience, but I can see no reason why such a scheme could not be successfully employed, and consider the efficiency of the operation would be likely to be greater in the hands of officers of the Veterinary Department, who would rapidly attain considerable experience and proficiency.

If the suggestion (or modification of it if necessary) contained in Mr. Alexan-

der's letter is adopted, I think the incentive to illicit movement of cattle will be greatly reduced. Whether cattle on farms adjoining an outbreak can be dipped every ten days, for three months, in arsenical dip without injury, is perhaps questionable, in view of the cumulative action of this drug.

The general principle of supervision of travelling cattle is good, and if such, when travelling from suspected towards clean centres, could be dipped twice at least, at a ten days' interval, risk of extended spread of the disease would undoubtedly be diminished. I have no doubt that the principle of dipping as a means of arresting the disease has, as Mr. Alexander says, not received a fair trial, and such want of success can certainly not be urged against the adoption of the system which should be amply carried into effect. The advisability of securing adequate supplies of arsenic, caustic, etc., has doubtless not been lost sight of by the Government.

I am of the opinion that a fence constructed round infected or gravely suspected centres would be an extra precaution in preventing or restricting movements of animals. I know of no instance in which game have been suspected of carrying the disease, nor do I think it at all likely that such will prove to be the case. Had the disease been capable of transmission by game, it seems probable it would have been spread through this agency before. Further, it does not seem at all likely that the disease would be transmitted through the progeny of infected ticks, which had attached themselves to other than a bovine host, to their offspring. The essential and appropriate host, as far as we know at present, is the ox, and any deviation from the bovine host would probably result in the loss of all specific pathogenic properties on the part of the young tick. But of this point we have no exact knowledge.

ENTOMOLOGICAL OPINION.

The reply of the Government Entomologist stated:—

1. To my knowledge, no instances

have been recorded of game contracting Rhodesian redwater, nor are there any recorded instances of game contracting ordinary redwater. Both would appear essentially bovine diseases. Hence the buffalo may suffer.

2. In the event of an infected (*i.e.*, pathogenic) tick maturing on an animal other than of the ox family (*bovinæ*), its progeny—from analogy—will not carry or transmit the disease. (As no direct experimentation appears to have been carried through as yet in this connection, and as there are numerous possibilities and probabilities to be considered, this statement cannot be accepted literally.)

3. The shortest period in which disease could become apparent when conveyed by an infected tick (*i.e.*, pathogenic or disease-producing) is regulated (*a*) by the period of gestation, (*b*) the period of incubation of the tick's eggs, and (*c*) the period of development of the disease, *i.e.*, ten days.

(*a*) and (*b*) will both be governed by climate, and I would put the shortest period for the two, from records taken last summer, at 37 days. The shortest possible period would, therefore, be about 47 days if the Blue Tick (*Rhipicephalus decoloratus*) carried the disease.

The longest period would be governed by the longevity of the young ticks. This, during summer, may be put down at four to five months. Should the larvae be born in the fall of the year—say, April to May—this might be lengthened to nine to ten months. These remarks are based on observations made in connection with the small blue tick—the common tick of South Africa. From observations and experiments conducted by Mr. Lounsbury, Government Entomologist of Cape Colony, it would appear that the conveyor of Rhodesian Redwater is another tick which is pathogenic in the adult stage and not in the pre-adult stages, although it inherits the infection from its parent.

4. Following on the above, the disease may appear in infected veld from 80 days to 18 months after diseased or recovered tick-infested animals have passed over it.

Game Reserve.

IT is proposed to establish a reserve for the preservation of eland and other game, for which purpose some 30,000 acres of Crown lands under the Berg near Giant's Castle, are to be laid off and enclosed with wire fences. Mr. S. Barnes has been appointed to take charge of the Reserve, and he is obtaining from Zululand picked mounted men to act as game guards. All trespassing on these lands will be put a stop to in order that the game may be disturbed as little as possible.

Game from other parts of South Africa will be introduced after the fencing is completed. It is further intended that where the land is suitable to plant trees on a considerable scale, and eventually to give the Reserve the character of a public park. The scenery in the neighbourhood of Giant's Castle is magnificent, and the climate being bracing, the Game Reserve should become a valued place of resort for persons desiring pleasure or in search of health.

Central Experiment Farm.

MONTHLY REPORT.

DIRECTOR OF AGRICULTURE.—

THE month of September was remarkable for extreme drought, .09 being the total rainfall registered; the temperature during the second, and especially the last week, was high for the season.

On the 26th a heavy flight of locusts passed over the farm, doing slight damage to a portion of oat plots on the flat.

Ploughing for main crops is fairly well up to date, considering the somewhat reduced condition of the oxen due to lack of sufficient pasture.

Suitable heavy draught horses have now been supplied to the Field Experimenter, who has consequently been able to conduct his work in a more expeditious and efficient manner than hitherto.

Field experiments of over 200 plots have been laid out during the month and sown or planted with the following crops, viz., Potatoes, Oats, Sunflower, Sorghum, Peas, Beans, Lupins, Lentils, Lucerne, and Linseed. These have been laid out with the object of ascertaining the most suitable manures, the best mode of applying same, as also the best distance for planting, and most economic and efficient quantity of seed per acre. It will be interesting to watch the results of some 69 varieties of maize, as, independent of

the variety section, those, so far as area will admit, are to be planted over the farm with a view to prevent hybridizing. In consequence of this wide distribution, special supervision will be necessary to prevent theft of the crops by the natives. The horse-tooth mealies, which were planted on the 14th August, are, despite the excessive drought, looking remarkably well. The early planted potatoes, which are well above ground, look healthy, and give good promise.

It is very satisfactory to note the rapid progress in the erection of permanent buildings for the employees; the quarters for the Field Experimenter and assistants are almost completed.

I desire to record my appreciation of the commodious and comfortable house provided for myself, which I occupied early in the month.

ALEXANDER REID,
Farm Manager.

According to the Buenos Ayres "Standard," lucerne growing for pasturage in Argentina is only in its infancy, and five years hence there will be twenty times the present acreage. Then Argentina, it is continued, will have the greatest stock of fat sheep in the world.

Furniture from Natal Timbers.

(By T. R. SIM, Conservator of Forests.)

IT is very strange that, despite the fully recognised qualifications of several Natal timbers for use in the manufacture of furniture, good specimens of furniture made from indigenous timber remain scarce, and each owner looks upon his own specimen as unique. The remote localities from which the better kinds are brought, and the greater ease with which imported furniture can be obtained, may in part account for this; as also the fact that no industry in Colonial timber *alone* has yet been started. A beautiful side-board now to be seen in Mr. Hughes cabinet works, Church Street, Pietermaritzburg, is, however, probably unique of its kind, and shows an excellence which may well bring the kind into prominence. It is made from the tree known to the natives all over the Colony as *isi-fue*, and to those on the coast as *In-hluti* or *um-hlutiwezinga*, (*Rhus longifolia*, Sond.) and has been made for Jas. Schofield, Esq., M.L.A., from timber grown by him on the Umkomaas. The timber is of a light pinkish colour, beautifully grained, hard and yet light, and not difficult to work or to finish well by varnish or polishing. The centre-wood is mapped or shot with nearly black streaks, giving a very pretty effect. The tree is common throughout the Colony, especially on or near the coast, and usually is of 12 to 24 inches stem diameter, and 20 to 50 feet stem height, and more easily obtainable than any of the timbers meantime used for furniture. It prefers the outskirts of forests, or open scrub, to dense forests and in Pondoland and Kaffraria, where

also it is frequent, it is often standing alone, or with *um-doni* (*Eugenia cordata*) along the courses of streams whence fire has removed all other trees, these two kinds being able to survive more fire than most of the others. It is, in these circumstances, known in Kaffraria as "guacha" (ghost, or witch-doctor), but is not used there for any timber purposes. The dry timber weighs about 42 lbs. per cubic foot.

Fourcade in his "Report on Natal Forests," mentions that the timber is "used for beams, planks, rafters, etc. not very durable in water, or in contact with the ground. Milky juice from the bark used by the natives as a depilatory."

The tree is illustrated by Wood and Evans in "Natal Plants," plate 69, where it is said: "The tree is known to the natives as *isi-Fue*, and they use the gum which exudes from the bark for fixing the blades of the assegai into its handle; as a depilatory, they simply smear their fingers with the gum so as to enable them to take a firm hold of the hairs, which they then pluck out by the roots."

They also add: "The bark analysed by Mr. Stephen for the Colonial and Indian Exhibition gave 18 per cent. of leather-forming material, or 7.20 per cent. of tannin; or dried at 110 centigrade, gave 7.48 per cent. of tannin."

Will correspondents who have tried *isi-fue* timber inform me of their experiences, as Coast and Inland timber may not be of equal value? It is one of the three kinds of trees reserved by the Natal Native Trust in its forests.

Hereford Cattle.

(See Illustration.)

THE Hereford breed is believed to trace back to the aboriginal cattle of the County of Hereford and the adjoining districts. The improvement was commenced by the Tomkins family in 1766,

and since then other breeders of skill and enterprise have continued the work so well begun. In the building up of the improved Hereford, foreign blood to some extent has contributed, but the

aboriginal strain is always dominant. In colour the Hereford is red with a white face—"the tribal badge," as it has been called—white marks in the top line of the neck, back over the crops as well as in the chest and bottom line all the way backwards. The following is from the "History of Hereford Cattle," by Macdonald and Sinclair, and published by Vinton & Co., London:—"An important characteristic of Hereford cattle is that they carry flesh most heavily on the parts of the frame from which the best meat is cut. Their broad backs are usually loaded with meat of the very finest quality, and the average Hereford carcass is found to have its fat and lean mixed in the most admirable manner.

Butchers and consumers alike hold Hereford beef in the highest esteem; indeed, the grass-fed Hereford beef enjoys quite an enviable reputation, and brings top figures in the best markets of the country.

. . . Hereford cattle are unsurpassed as graziers. Robust in constitution, quiet in temperament, kindly feeders, and large growers, they thrive and fatten admirably on pasture land." In stature, height, and weight the Hereford closely corresponds with the Shorthorn. Dairying has not formed a prominent feature in the agriculture of Hereford, and consequently the milking properties of the breed have been neglected. Herefords in former days were held in high repute for draught purposes.

Correspondence.

To the Editor Agricultural Journal.

DRAIN PIPES.

SIR,—Are you aware that a draining tile cannot be bought in the Colony?

Could you not kindly interview some of the Maritzburg brick makers and induce them to make and stock this article. I am sure, now that so much land is under irrigation, there will be a ready sale for them when it is known that they are to be had.

Yours, &c.,

ALLAN STUART.

Glen Stuart, Estcourt.

[See Passing Notes.—Ed., *Agricultural Journal*.]

ABORTION IN COWS.

SIR,—In reply to "Farmer" in the last issue of the *Journal*, a great cause of abortion in cows and sheep is allowing them to run in new burns where the ash is still on the ground. The ash, being salt, has a great attraction for sheep and cattle, but its consumption is invariably attended with great loss.

Yours, etc.,

A. J. S. MARITZ.

Mahlabatini,

10th October, 1903.

Weenen Agricultural Society.

THE following is taken from the Annual Report of the President of the Weenen Agricultural Society, Mr. H. Blaker, J.P.:—"In presenting my first report, and the 38th of the Society, I am glad to say that the show of 1903 proved a complete success, in spite of many predictions that it could be nothing but a failure—owing to shortness of produce, and drought, and that stock

would not be shown. Notwithstanding, we have passed through one of the longest and most severe droughts the uplands of Natal have ever experienced, it is an undeniable fact that the produce shown this year was the finest collection brought together in Weenen County, and it reflects great credit on the producers. I was greatly surprised at the quantity and quality of the various roots; the ex-

hibits would not have disgraced any English show. The roots were all well grown, and the exhibit of potatoes the finest ever seen in Natal. The show of winter fodder was excellent, both in quality and variety. Some of the sugar cane was ten feet high, grown in the county. If farmers can show a good crop of sugar cane, they need not fear bad winters or lack of food for cattle, but ought to have cattle fit to supply the local trade, and exclude imported meat. The exhibits of grain were also unusually good and numerous. The produce, as a whole, was a grand sight, classes, as a rule, well filled, and competition keen. The tables were better filled than they have been of late years. The exhibit of butter was large, and most difficult to judge, the quality being very uniform, but as the judge was the most competent man the Society could obtain in Natal, he accomplished his task, and everyone felt satisfied that it was ably done. I hope, next year, the tables will be crowded with manufactures, for, in producing jams, pickles, bottled and dried fruits, bacon, lard, etc., we are keeping back the importation of such articles. If we only make up our minds to produce these things on our own farms, there is no reason why we should not drive these imported articles from our markets. During the war, other Colonies found Natal as good a market as they could get, and the imported article rules the price. If we are to go ahead we must try to reverse this order of things. We must produce more on our farms, and combine to get our markets ruled by Colonial prices. In exceptional years, such as we have passed through, we are thankful to have the imported articles to supply our needs. Now the country is settling down, and a steadily increasing population is coming in, we must produce and manufacture more. The time has come when we shall have to be content with lower prices for our stock and produce. We must not be content to say, as we have been in the habit of doing, "It is too much trouble: that is good enough." We must work harder, and farm our lands better than they have been in the past. The greater supply of fodder we can grow, the better

beef and mutton we can supply to the consumer. All through the stock there was a marked improvement. The blood horses showed more bone and substance. The cart horses were good, but deficient in numbers. The general purposes were a useful and servicable lot, showing both strength and endurance. This is the right stamp—if we can only produce enough of them. It is admitted by the military, and commanders of irregular cavalry, that no horse can beat the South African—for constitution, hardiness, good feet, and willingness, he will hold his own against horses from all parts of the world. Cattle, which have been hitherto the strongest feature of our show, were, this year, very deficient in numbers, but this is easily accounted for, as rinderpest had broken out in the county a little before, and the scarcity of winter keep combined to deter intending exhibitors from showing. The classes in Shorthorns were well filled, and, from the biggest to the smallest, they were an even lot. The Friesland, dairy, and Africanders, were all deficient in numbers, though what were shown were good of their kind. Classes were badly filled. Stock breeding requires careful study and patience, and, especially, horse breeding is surrounded with difficulties and disappointments, perhaps more than other stock. Should a foal meet with a serious accident it is ruined for life, whereas a beast meeting with the same might be fattened for slaughter. One of the great difficulties a breeder has to contend with is that stock do not grow in bone as well as they used to do. In a climate where stock have a tendency to decrease in bone, the material to make it must be supplied artificially. Farms are fenced in and runs curtailed so much that I think the time is not far off when we shall have to plough the veld and plant English grasses: the veld grass grows scantily on the ground, and the softer and sweeter grasses become fed out, and what remains is not wholesome or digestible. During the drought stock eat these grasses, and this is the cause of a good deal of non-thriving. If we could only manure up the vacant spaces on

each acre we should be surprised at the amount of waste space. English grass covers the ground like a mat; and acre after acre is solid grass; this makes the difference between our veld and English meadow land. Sheep formed the strongest feature of the stock part of the show. It is some years since we had such a display—indeed, I doubt if it was not the best we have ever had. Both sections, Merinos and Downs, were well represented, and the classes well filled, while competition was keen between old exhibitors, and new exhibitors came forward with some splendid animals, and carried off prizes. The accommodation for sheep is not good enough. Horses and cattle are well provided for, and we ought now to turn our attention to shelter for the sheep, and I hope we shall have sheds put up before next show. The pens of goats were well filled—competition was good throughout. As usual they were much admired for their attractive appearance, and the judge was well pleased with them, and pronounced them worthy of a prominent place in any show. Pigs were poorly represented—entries, two only. There is difficulty in transporting these animals to show, but those living near could exhibit them without much trouble. In poultry, the entries were 25 last year, but this year 69. The Society had to provide more accommodation. Every class had several entries, and the birds were a grand lot, and a decided improvement over previous years. Poultry raising is an industry we should devote more attention to. Where a farmer is lucky enough to have daughters who can attend to the chicks, there is money to be made by incubation, and I would strongly recommend going in for up-to-date incubators and rearers. There will always be a demand for poultry and eggs in our two towns, and with the shipping, Johannesburg, and Pretoria, and the military, we shall find it difficult to keep them fully supplied. Your last show was an agreeable surprise, and a great success—the number of entries 833, against 512 for 1902, bringing it into the front rank of our big shows. There is a custom in Natal which ought to be stopped. It tends to

more mischief than anything—the custom of one man taking Kafirs on to his farm, who have been turned off by a neighbour. It makes Kafirs insolent and disobedient, and encourages stock thieving. When a native is turned off a farm for misconduct, he cares nothing for it, as he can go to a neighbouring farm, and pursue his old ways. This point I would impress on those who have done it, or may think of doing it. If Kafirs knew when turned off a farm that they must either go into the location or leave the district, it would be likely to cause them to behave themselves, or keep in with the master or landlord. I would mention the action of the Nottingham Road Farmers' Association. Under the new Act any Kafir, or kraal, which has been convicted of stock stealing can be removed from the district, and every member of the Association binds himself to do his best to help carry out this arrangement, and report theft, and the Kafir is sent away. This Act is working so well that it has a beneficial effect in reducing stock thefts. This action was brought before the Mooi River Farmers' Association, and they have agreed to it. Let us do the same, and then we shall have combination from Nottingham Road to the Tugela, and get rid of the thieves. I beg of you, from this day forward, give up taking another's Kafirs on your farms: it is a foolish short-sighted policy, to say the least of it.

An extraordinary instance of the prosperity of Indian emigrants in suitable colonies has just been furnished by a shipload of these people, who returned to Calcutta on February 24, by the steamer "Mersey" from Trinidad. There were 737 returning emigrants on board, and they landed bringing nearly £10,000 in drafts, coin, and jewellery. State-regulated emigration to Trinidad has gone on, now, for upwards of half a century, and the carefully kept records disclose the fact that, since 1851, when the first Indians began to come back, the returned emigrants have brought with them savings to the value of £386,000 actually declared. This is, of course, merely what they have carried back on their persons and in their pockets, and takes no notice of the large sums that are remitted to India as they are saved.—"The Pioneer," Allahabad.

Farmers' Experimental Plots.

FARMERS are invited to send in applications to the Department of Agriculture for the establishment of experimental plots by the Department on their farms. These experimental plots, otherwise known as *Farmers' Demonstration Plots*, are for the purpose of testing and demonstrating on the farms themselves in the different districts of the country the effect or suitability of manures, modes of cultivation, and varieties of seeds. The plots are of the same form and general description as those recently established at the Central Experiment Farm. The plots at the Experiment Farm have attracted much attention from the many farmers of Natal who have seen them; and the photographs and descriptions of some of them, which have already appeared in the *Agricultural Journal*, will have conveyed some idea of their nature to those who have not had an opportunity of visiting the farm. The farmers' demonstration plots will differ from the plots at the Experiment Farm in being less elaborate and fewer in number. They would vary in number from about 12 to 18; and only in exceptional cases would they be over 24. But although fewer in number, they have the great advantage of practically testing the soils on the individual farms, and of enabling the farmer to watch for himself their course of growth. They, in fact, serve as a very effectual medium for disseminating throughout the country the results of proved value obtained by the more elaborate work of the Experiment Farm. In the State of Victoria, in Australia, it is no exaggeration to say that there was no more popular movement amongst the farmers than the establishment of these plots. The applications for them during recent years have exceeded 500 annually. Resolutions and letters of thanks for them were very numerous. The following two samples are here given merely to indicate the general appreciation:—

From the Secretary, Minyip District,
Agricultural and Pastoral Society,

10th June, 1901.

“At a recent meeting of my society a cordial vote of thanks was passed to you (and also to Dr. Howell) for the splendid service you have rendered to this district by your system of experimental manure plots.”

(Signed) J. D. HECKLE.

From Mr. Thos. J. Farley,

Derrinal.

26th December, 1900.

“I sincerely thank you for the great interest you have taken in the plots, and for the amount of good they must do to the agriculturist throughout the whole Colony. The farmers here have taken great interest in my plots, and are anxiously awaiting to hear final results, and several of them have asked me to express their thanks to you for the amount of good you have done.”

It is proposed this season to make a small beginning in Natal with this system of plots, and preparations for them are being commenced. Only manure plots will be undertaken this season, and perhaps a few varieties of seed plots. Plans will be prepared by the Department, giving particulars as to the area and dimensions of the land required. These plans will be forwarded to farmers on whose land it is finally decided to conduct the experiments, and the farmers will be asked to prepare the land and have it ready by a date to be agreed upon. On that date, some one of the Department will visit the farm, taking with him the manures, already weighed out, mixed and bagged, and also the numbered pegs, and will put in the plots. For the manure experiments, the farmers will be asked to supply the seed. At harvest time, in a few cases, some one may be sent from the Department to harvest and

weigh the crops; but in most cases farmers will be asked to attend to this themselves, and to forward the result to the Department. Reports of the results will then be made out, and sent to the individual farmers; and finally, a general report for the whole Colony will be published.

As a general guide to the amount of land required, it may be here stated that each plot will be one-twentieth acre in area, so that a 12 plot set together with borders and head lands would require about 1 acre, an 18 plot set about $1\frac{1}{2}$ acres, and a 24 plot set about $1\frac{3}{4}$ acres. The length, including head lands, would be about 300 feet. Plots of one-tenth acre each might be arranged for in special cases; but in this country delay might be caused if the operator had to take with him the heavy lots of manures required for larger areas. The land to be selected for the plots should be as even

and uniform as possible; and should not have been previously manured, or, at any rate, not for some years.

Applications for these plots should be sent in at once to the Director of Agriculture, Department of Agriculture, Pietermaritzburg; and applicants should state on what particular crops they desire to have experiments tried. The following crops are suggested for the purpose:—Maize, Kaffir Corn, Oats, Wheat, Barley, Rye, Rye and Tares, Beans, Peas, Earth Nuts, Potatoes, Swedes, Turnips, Mangolds, Beet Root, Sweet Potatoes, and Sugar Cane. For tobacco, Tea, Coffee, Pines and Fruit Trees, special arrangements would have to be made.

A. N. PEARSON,
Director of Agriculture.

Department of Agriculture,
Pietermaritzburg.
Oct. 12th, 1903.

Infectious Abortion in Cows.

THE important investigations carried on with such untiring zeal by Professor Nocard will, it is hoped, writes Mr. H. Leeney, M.R.C.V.S., in the *Live Stock Journal*, be pursued by his disciples in this and other countries, for certain it is that more dairy farmers are ruined by the insidious attacks in their herds of infectious abortion than by all the diseases of cattle put together. Professor Bang, of Copenhagen, isolated the specific microbe, and his discovery, like that of Professor Koch's identification of the bacillus of tuberculosis, brought hopes to the hearts of agriculturists that have not been realised, or only in small measure.

If it were possible to distinguish the first case which occurs in a herd, as infectious, or if cow-keepers could be sufficiently impressed with the importance of immediate segregation, much more might be accomplished in preventing the spread of the disease, but neither the one nor the other seems as yet in sight, and the helplessness of the

veterinary surgeon, when called in, is humiliating to any but those possessed of a large amount of professional pride. To recommend separation of the aborted animal from the herd is a first precaution to be observed, but a sufficient time has elapsed to have conveyed the disease to others, even if the first case has induced the owner to seek advice. This is, however, seldom the case; there have been losses already, which cannot be accounted for; the usual ceremonies have been performed, the placental membranes have been spread upon a thorn bush, in accordance with the best traditions of the village seer, and a temporary arrest of the disease has lent credence to the superstitious beliefs while the immunes have calved, only to plunge the dairyman in despair when cow after cow presently loses the fruits of conception. I have a letter before me (of the date upon which I am writing) from a dairyman who says, "I have tried Nocard's plan, but it has failed, and the cows strain very much," and goes on to say, "I have been advised

to give up breeding for a time, but it would suit me better to go on stocking cows, if I don't keep on having them slip their calves." Yes, here is the crux of the matter, and I have endorsed his friends' advice to give it up for a time. If Nocard's method has not succeeded with him when he entered upon the task hopefully, it is not likely that he will be more successful on a second attempt, and after the micro-organism has had more time and subjects in which to propagate. Nor is this any reflection on the system advocated by the great veterinarian so recently passed to his rest; the proper disinfection of the byre, of the various utensils, and of the milkers, besides the frequent applications to the cows themselves, would constitute no easy task, if the persons were all trained hospital orderlies, but with the class of men obtainable, such accuracy is not to be expected. Moreover, we have it upon the high authority of Bang, that the organism responsible for epizootic abortion is capable of remaining in the calf bed and retaining its vitality from one calving to another, despite the most careful irrigation of the uterus with dilute preparations of bichloride of mercury and other germicides. "Animals which have aborted should be fed off, for the microbes are dislodged with difficulty, and fresh generations are liable in subsequent conceptions to repeat their attack" (Nocard). With such an *obiter dictum*, the believer in expert advice will hardly put an aborted cow to the bull again; hardly, I say, for there are cows from whom one bull calf would be of so much value as to make it worth the while of a particular owner to gamble on the chances; or she may be a deep-milking Jersey, quite useless to the butcher, or belong to a poor man whose fortunes will be broken by losing her by sale to the cag-mag man. With a bag that springs at all, the less scrupulous dealer will know how to sell her, with a calf from somewhere or other. We have still to account for the great class of unbelievers whose faith, when they had any, has been rudely shaken, by much vaunted prophylactics, too hastily advocated by individuals whose authority should carry

weight. The last-named share the hopefulness which has ever characterised the farmer in pitting his industry and intelligence against the seen and unseen enemies which wage perpetual war with him. These are the men who, unwittingly, infect the bulls often generously placed at the service of a district by landed proprietors, whose liberality receives but scant recognition.

Clients troubled with abortion in their herds invariably cast about in their minds for the origin of their bad luck in some cow they have bought out of the district, forgetting that a male is frequently responsible; nor are the less thoughtful among them easily convinced of the bull's responsibility, since he does not convey the microbe at all, or even to any considerable number, of the cows sent to him.

The advice to fat off the cow that has aborted can then be acted upon in a general way, but what of the herd containing suspects and in-contacts? My own experience leads me to think that safety is only to be found in the abandonment of breeding for a time. Unfortunately, the man who arrives at such a decision too often disposes of his cattle at auction, and disseminates the disease. However morally culpable, he is within the law in so doing, and an amendment is urgently required. It should be made an offence to dispose of cows known to be affected with epizootic abortion, as it is at present to lead a glandered horse through the streets, or remove swine affected with fever. There will be many cows in a milk-seller's herd yielding a profit on their keep so long as they give three gallons of milk daily, but which will not pay for the fattening off, so easily recommended; hence, the great temptation to sell, and make room for young Shorthorns or mixed breeds recently delivered of second or third calf, which may yield a profitable amount of milk for a period of from fifteen months to two and a half years, and be developing into butcher's beasts of at least second-class quality. It is not possible to say how long an empty cow will milk, but it may roughly be stated as twice as long as a pregnant one at least, and London dairy-

men have found it worth while to keep cows after the expiration of more than two years.

Spaying, or removal of the ovaries, is considered by some as lengthening the period of lactation, but I have never been able to satisfy myself that such is the case. That unsexed animals have a disposition to put on fat is beyond doubt. The question is, Are we justified in performing the operation, and will it pay? In order to answer these, we should consider the methods. The old-fashioned plan, still carried out in some of the Western counties, for cows turned off to graze in mixed company, and to avoid pregnancy, is to strap the subject to a gate or to fixed points in the ground, and to operate by an incision through the flank. Some of the castrators in districts known to the writer perform this operation with considerable skill and very quickly, and, despite the total neglect of all antiseptic precautions, very rarely cause the death of a cow. The modern system of performing from inside, by an incision through the vagina, with the animal compelled to stand through a long and extremely painful operation, appears to me wholly unjustifiable. If total anaesthesia were practised, as with bitches and cats, the after pains need not weigh heavily upon our consciences, but to perform *per*

vaginam in a prone cow is well nigh impossible—anyhow, the advocates of the method do not attempt it. Will it pay? So far as I have been able to ascertain, the answer is in the negative. Those who have given it a trial have either been dissuaded by fatalities, or ceased to practise it because unable to discover a sufficient gain on the average, after taking into consideration the cost of operation, the temporary illness, and reduced milk yield.

In recommending a dairy farmer to cease breeding for a while, there are so many considerations to be kept in mind, such as the nature of the holding, the possibility of rearing bought-in animals, whether of the bovine or other species, and the unfortunate owner of a herd invaded by epizootic abortion need sit down with his "thinking cap" on, and make calculations worthy of an actuary, before deciding what he had best do. So natural is it for the occupier of land, whether engaged in general husbandry or in dairying, to look for his profits in breeding, that the other aspect presented above has not been well weighed; nor is any great assistance to be derived from the study of dairy methods in great cities. The study of abortion and how to farm against it, is worthy of the earnest attention of our greatest agriculturists.

Rhodesian Tick Fever.

SOME SUGGESTIONS.

By S. B. WOOLLATT, Principal Veterinary Surgeon.

THE Minister of Agriculture having requested me to put into plain and simple language as devoid as possible of technical terms some remarks upon Rhodesian Tick Fever, the following information and views regarding this disease and the methods to be adopted with a view to preventing its spread are published as being of interest to the farming community:—

Our position has become more serious since the recent outbreaks of the disease in the Transvaal, near our Border, in the Piet Retief and Wakkerstroom Districts. These cases are more dangerous to us—

as I have previously pointed out to you—than the outbreak which exists at Ingwavuma. Those who know northern Zululand will understand this. There is no question that the disease is carried by ticks and their progeny, which have acquired infective properties from infected animals. It is said that the disease is carried by a special kind of tick, but for practical purposes we must direct our attention to all varieties. We have ticks practically all over Natal, but until they have acquired infective properties from infected animals they will not communicate this disease. We

must, however, do all we possibly can to reduce their numbers so as to be more prepared for dealing with Rhodesian Tick Fever. I think it is to be somewhat regretted that the name Redwater was ever applied to this disease, as it naturally leads many to confound it with Redwater as known in Natal. Rhodesian Tick Fever is distinct from Redwater, although the two diseases are alike as regards dissemination and veld infection, and show many similar symptoms and post mortem appearances. They are diseases of a similar nature (malarial). The immunity possessed by Natal cattle against Redwater—which in many districts is considerable—is of no value in withstanding the assaults of this disease. Our cattle will show themselves as susceptible to Rhodesian Tick Fever should it come into Natal as they were to Rinderpest when it first came. Owners must not feel too secure and in consequence neglect to take the necessary precautions, should the disease appear in their vicinity, because they know their cattle to be immune against Redwater. In endeavouring to prevent the introduction of this disease we must prevent the introduction of cattle. These animals are the most common means of disseminating ticks and are naturally susceptible to this disease apart from the possibility of their being introduced in an infected condition. Ticks can travel only short distances, but I do not think this will prove to be of any great consequence. Many other animals carry ticks, but it has yet to be proved that the progeny of ticks which mature on animals other than cattle are not capable of conveying the disease. Until this has been proved or otherwise we must take steps to prevent these animals from bringing ticks across our Border with the least possible inconvenience to the public. I do not think we need attach much importance to the probability of birds carrying infection, as some people appear to fear. We shall find in almost all cases where outbreaks occur that the infection has been brought by infected cattle which have recovered from the disease, or by cattle carrying infected

ticks; such cattle having passed over or grazed on the places where the disease has broken out.

It will be understood that transport cattle, by reason of their travelling, intermixing, and grazing on veld on which other cattle have been grazing, are the most likely to contract and disseminate the disease. These animals may carry the infection for long distances and infect many different centres. They must therefore be considered the most dangerous means of spreading the disease. This disease is not contagious in the ordinary accepted meaning of this term. Animals acquire it from infected veld, that is veld on which ticks infected with the disease exist. It will be understood that the disease is more virulent and more easily disseminated on veld favourable to the life of ticks (low veld) but owners living on high veld must not feel that their cattle are secure against the disease, as appears to be the idea in some quarters. Cattle which have become actually infected will die after removal to high veld and will contaminate the veld where they die or graze by means of ticks which fall from them. It is owing to the high veld not being so favourable, particularly in winter, to the life of ticks that the infection has in some cases appeared to soon die out. Veld which has become infected remains so for an indefinite period if animals susceptible to the disease are allowed to go on to it. Ticks cannot propagate without a host to mature on, and to insure the cleaning of such infected veld, all animals on which ticks may propagate must be kept off or so thoroughly and constantly dressed as to prevent any ticks maturing on them. Ticks which mature on animals suffering from, dying, or which have recovered from the disease, transmit the infective properties to the young ticks which hatch from the eggs they lay. The young ticks, at a certain stage, infect the animals they attack. Up to the present, any attempts made to save animals actually infected have been of no value, notwithstanding the many and varied remedies claimed

to be cured by several individuals, and we must therefore direct all our efforts to preventative measures. It has been shown that this disease is undoubtedly carried by ticks—it is probable that it may be a special kind of tick—and therefore every effort must be made with a view to their destruction as much as possible. It can be argued, that even by constant dipping animals in badly tick infected districts cannot be kept free from ticks, but, as before stated, ticks cannot propagate without a host, and the dipping which destroys practically all those on an animal and thus prevents them maturing, must ultimately reduce their numbers in such districts and in time enable the animals to be kept free from ticks by dipping. No time should therefore be lost, even if the disease is at a distance, in endeavouring to reduce the tick infection. The Government intends to do all it can to assist in the building of Dips. A number of Dips will be built by the Government, and this work has been commenced in the northern districts which are in more imminent danger. It will be understood from the remarks regarding transport cattle, that the public roads are more liable to become first and mostly infected, and we are therefore at the outset directing our attention more particularly to dealing with transport cattle as regards the building of Dips. For ordinary farm stock to use public Dips is not free from danger if this necessitates their travelling for any distance to reach such Dips, and the intermixing of cattle is never to be recommended. Those possessing any number of cattle should build Dips of their own as much as possible, to be used by their own and their immediate neighbours' stock only. It is most advisable that oxen used for transport purposes, necessitating their travelling along public roads be kept isolated, and be given a distinct grazing ground from the ordinary farm stock when at home. The oxen are more liable to first contract the disease should it exist in the vicinity, and if this pre-

caution be adopted it will considerably lessen the risk of infection of the other stock on the farm. It is strongly recommended to those living in districts bordering on outbreaks (at present Utrecht, Vryheid, and Paulpietersburg Districts), that a portion of their farms be kept entirely free from cattle so as to permit, in the event of an outbreak occurring amongst the cattle on such farms, of the removal, after thorough dipping, of the cattle to clean veld. It appears essential, if it is hoped to save cattle in a troop which may become infected, that the first animal, or few animals to contract the disease and die, should be reported, and all care taken to decide as to the actual cause of death. The history of many outbreaks more among ordinary farm stock than among transport oxen, shows that one or a few animals in a troop become sick and die, and no further cases occur for several weeks. It will be understood that, if these first few cases are observed, at the outset, and the remainder of the animals thoroughly dipped and freed from ticks, and moved into uninfected veld, that there is hope of saving such animals. The animals in which the infection already exists will die, however, notwithstanding the dipping and removal. After such cattle have been removed to clean veld (on the same farm), the dipping must be continued. It is found that after animals have been dipped that it takes some three or four days before all the ticks leave the animals, or are destroyed. It will therefore be necessary to endeavour to insure against animals carrying infected ticks on to clean veld, to dip twice with an interval of three days, before removal on to such veld, and to remove the animals direct from the second dipping. Mr. Fuller found that some of the mature ticks which existed at the first dipping did lay afterwards, so this must be guarded against as far as possible. If at the second dipping it were found practicable from the number of animals to deal with to remove any mature ticks and destroy them, we should then feel

more certain against the possibility of carrying the infection. It is a serious matter to infect veld, for, as Mr. Fuller has pointed out, from experiments and observations made by Mr. Loundsbury, Cape Colony, it has been found that owing to the length of time for which a tick can exist without food, and to certain peculiarities between the tick and this disease, the veld may remain infected without the disease making its appearance, even with susceptible cattle on it, for a very prolonged period. This fact alone, where cattle are moving about, renders systematic dipping the only safe guard in preventing the spread of the disease. A study of the life history of the tick now identified as the carrier of this disease, shows that twice during its growth from the young seed tick up to adult stage, it leaves the animal it infects, and in these two stages—the larval and the nymph stages—it does not communicate the disease to its host. This only occurs where the tick reaches its adult or sexually perfect stage; in this respect it differs from the tick which conveys ordinary Redwater, which communicates the disease directly it gets on the animal after hatching from the egg. It follows from this that susceptible animals may carry the tick for long distances in its two pre-adult stages without any indication of the disease becoming manifest. It is comprehensible that a fresh outbreak of the disease may make its appearance many miles away from an old centre, a distance only governed by the time a beast can travel in sixteen to twenty days. Dipping or dressing for ticks, unless carried out systematically, cannot be expected to be very successful. Under the existing Act the Government has the power to order the dipping, etc., of any cattle, and while it is not intended to unnecessarily inconvenience owners under this Act, they should make preparations to meet requirements should it be found necessary and advisable to enforce the Act. At present all farms—the farms are specified—within roughly an eight mile radius of our northern border as

far as the Buffalo River are quarantined, and the movement of stock with the exception of transport cattle prohibited.

The people here must obtain supplies. Cattle (transport) must be dipped, or at present dressed for ticks (as our Dips are not completed) before leaving, and this dipping, or dressing, must be repeated at stated intervals. We are pushing on with the building of Dips at the chief centres along the public roads, in the northern districts from our border, as quickly as possible, and it is further intended to compel all cattle on such roads to obtain certificates showing date of last dipping, such certificates to be produced and the cattle inspected and checked at each Dip along the road. The cattle must be again dipped at the expiration of each certificate. Each certificate will hold good for probably 15 days, and cattle travelling between given points may be required to dip going and returning. The owners or persons in charge of cattle found on public roads without such certificate, or with certificates which have expired, will be proceeded against and their cattle quarantined. The Dips will be placed at convenient distances, and owners of cattle must arrange for the dipping within the time allowed. This will apply to all cattle travelling along public roads where the Dips exist. Land owners or occupiers of land should do all in their power to prevent, and take action against all Natives or others found travelling cattle across their lands in order to evade the restrictions against travelling by road. The Native cattle owner is at all times a great source of danger to the stock owners of this country, and at the present time, with the possibility of this disease coming amongst us, no opportunity should be given them to evade the requirements of the law. It is not advisable to work cattle for at least two days after being dipped, particularly after the first few dippings, and in summer time it appears to make them very susceptible to apoplexy or heat stroke, and animals affected in this way should be at once bled. The period of incubation, that is,

the time which elapses between the animal becoming infected and showing symptoms of the disease, is put down at about twelve days. When animals are exposed to infection the probabilities are, that they do not all become infected at the same time, and the incubation period will therefore in practice be found to vary. It has been shown that frequently, in cases of outbreaks of the disease, one, or a few animals only are first noticed to be sick, and that some weeks may elapse before others show symptoms, when many are found to be taken sick. This is probably due to the second lot of sick animals waiting for the young ticks which hatch from the eggs of those maturing on the original sick animals before becoming infected. It is to be presumed, that unless the original infection is very gross, only a few animals may be infected, but that these first few infected animals would greatly increase the grossness of the local infection as very many ticks may mature and propagate on one animal.

Symptoms.—The symptoms of this disease are not usually very characteristic. At the outset, high fever with its accompanying signs of dry muzzle, and frequently a staring coat and a slight cough are only noticed. The animal continues to feed and chew the cud, and, to the ordinary observer, very little is noticed wrong. If the temperature is taken at this stage it will be found to be very high, often up to 107, but the temperature varies, as is the case with most malarial fevers. As with ail fever, the animal is dull, does not feed well, and shows a tendency to hang behind the remainder of the herd. Milch cows give less milk, or the supply is suspended, and those heavy in calf often abort. As the disease progresses, the dullness is more marked, the ears droop, and the animal has a most dejected appearance, as is the case with Rinderpest. There is usually no running from the eyes, as with Rinderpest, and the running from the mouth is slight, if at all. In the early stages the animal may be constipated, but usually the faeces are normal. Diarrhoea and dysentery may, or may not set in in the

later stages, and this with the general dejected appearance of the animal, may lead one to confound it with Rinderpest. The diarrhoea is said not to be as profuse as in cases of Rinderpest, and there is no ulceration in the mouth. Staggering gait is often present, due to weakness in the loins, and in many cases animals become excited, and charge when approached, as is seen in cases of ordinary Redwater. In the later stages, animals are said to lie about constantly; there is twitching of the muscles, eyes become sunken, there is rapid loss of flesh, and they become very hollow or tucked up. In some cases the lungs are also affected, when, apart from above symptoms, the animal coughs, stands with its nose protruded, and draws in its nostrils, as in lung-sickness; there is often foaming at the mouth, and blood-tinged froth may be passed through the nostrils. In some cases red water is passed. Some animals die in delirium, while others succumb quietly. Death usually takes place from five to ten days after the disease has become apparent. D.V.S. Hutchinson reported, after his visit to the Transvaal in November last, that about sixty per cent. of the animals became affected with diarrhoea which had not the characteristic smell of Rinderpest. In no case did he see ulceration or crimson-coloured patches in the mouth. Some of the cases seen by him died in three days after first noticed sick, while others lingered as long as twenty days. He informed me at the time that he did not consider this disease identical with our Redwater.

Post-mortem Appearances.—The carcass will frequently be found with blood-tinged froth exuding from the nostrils (this when the lungs are affected). Many will show evidence of diarrhoea. The membranes of the eye and mouth are pale. On skinning the carcass the fat often has a yellow or brownish-yellow tinge, and much thin blood flows from the subcutaneous vessels, which is not commonly seen in other *post-mortems*. In cases where the lungs are affected, the wind pipe contains froth, and shows haemorrhagic spots (blood spots). The lungs are congested. On cutting into them this

same froth and clear liquid exudes. In many instances the lungs are mapped out with well defined lines of a clear straw coloured, jelly-like material (cedema), and are said to resemble the lungs in a case of horsesickness. The chest cavity frequently contains fluid. The heart sac invariably contains a quantity of straw, or blood-coloured fluid, which in some cases is considerable. The heart itself is flabby and pale, and haemorrhagic areas are seen on its surface. Around the base of the heart a jelly-like exudate exists, which may extend along the vessels leading up from it. The spleen is frequently enlarged as in melsickness, but its pulp is not usually so fluid as it is in that disease. It is not so often enlarged, however, as in cases of ordinary Redwater. Theiler only found it to be distinctly enlarged in three out of twenty-one cases.

The Liver.—This organ is invariably diseased. It shows congestion, is enlarged, and shows numerous spots (infarcts), varying in size from a pea to a walnut, and in colour from red to a dirty yellow; they frequently stand out above the surface of the liver, and give that organ a mottled appearance. The gall bladder usually contains a quantity of thick bile containing mucous, and may be brownish-yellow or dark green. Kidneys congested, substance friable, and show similar but smaller spots to those on the liver. Their covering may be infiltrated with yellow exudate.

Bladder.—This organ may or may not contain blood-coloured urine. In the majority of cases it is clear.

The Stomachs.—The first three stomachs are usually normal. The fourth stomach invariably shows areas of inflammation and congestion, and in many cases ulceration. In describing this ulceration, D.V.S. Hutchinson said:—"The edges of these ulcers are not jagged or surrounded by a dirty yellow exudate, as in Rinderpest, but are found, on being cleaned, to have clearly cut borders." In some cases the mucous membrane of this stomach is only thickened, and of a crimson colour. The small intestines are frequently congested, the mucous membrane thickened, and areas of yellow exudation may exist. Haemorrhagic spots may exist along their lumen. Large intestines show similar lesions to those found in the small intestines, but are not usually so well marked. The rectum frequently shows striated markings. The glands along the intestines are enlarged, and often watery on section, sometimes blood-stained. Exudation and haemorrhagic areas exist in and around the mesentery. A quantity of fluid is often present in the abdominal cavity.

S. B. WOOLLATT.

P. V. Surgeon.

13th October, 1903.

Natal Plants.

PART 3, VOL. II., AND PART 1, VOL. IV.

(O)NCE more we have before us proof of the assiduous perseverance of Mr. J. Medley Wood, A.L.S., in his endeavour to make Botany a popular scientific study in Natal rather than an abstract idea under which the popular florist's flower is not worth cultivation unless it has a label bearing an unintelligible Latin name. As long ago as 1888 Mr. Wood published "An Analytical Key to the Natural Orders and Genera of Natal Indigenous Plants," in which, in concise form, the relationships of different plants and different groups of plants to one

another are made clear. Following this up, he commenced the publication of "Natal Plants," in which representative species are taken individually, and not only described in detail, together with notes on relationship, peculiarities, habitat, use, common name, etc., but also, beautifully illustrated, so that no one can mistake what plant is being referred to, while the information given is, in many cases, of much interest and value, and such as he alone can authoritatively write on. The present issue is Part 3 of Vol. II., and, separately, Part 1 of Vol. IV.

Vol. II. deals only with grasses, that most useful group of plants which should naturally form one of the most interesting and profitable studies for a farmer to take up. Until Mr. Wood began to describe them, the grasses of Natal were roughly grouped as sour-veld grasses and sweet-veld grasses, with an occasional particularly objectionable kind known as wire-grass, or "kopper-dracht." Seventy-five species have been described and figured, so that any particular species can be referred to by name either in conversation or correspondence, while results of experiments in the culture of any kind, either for pasture, hay, ensilage or other fodder can be chronicled and understood by all. In Europe only a few of the many native grasses are used for pasture purposes, but that few, including Cocks-

foot, Meadow Fescue, Scented Vernal grass, etc., are found so superior to others that saving the seed of each separately has become quite an industry, and the resulting pasture well warrants the trouble and expense. By the aid of Mr. Wood's "Natal Plants," it is now possible to follow the same lines with regard to our indigenous grasses, to select and perpetuate what are worth keeping, either apart or in company with others, while many of the less valuable can be discarded. Mr. Wood's work gives the foundation on which all further correspondence and literature on this subject must be based.

Vol. IV. is of a more general nature, including representatives of many orders and genera, and is, like its predecessors, invaluable to the student of Natal plant life.

Butter Samples.

SAMPLES OF BUTTER FROM "BOSTON."

AFTER having carefully examined "Boston's" butter, which was received in good condition, I have scored it as follows:—Flavour, 46; colour, 5; grain and texture, 20; dryness, 9; style and neatness, 9—total, 89. This was a good sample of butter, the flavour being clean, but not quite natural, as it had a slightly bitter taste, which might be due to keeping the cream too long, or, possibly, to using inferior salt.

I do not think the bitter taste arose from any bacterial contamination of either the milk or cream, as is so often the case; in fact, really bitter butter is a disease, caused by different bacteria, and very often of a putrefactive form. This, however, was not the case with this sample, as the flavour was good, with the exception of the slight bitterness, which to an ordinary observer would scarcely have been apparent. The texture of "Boston's" butter still requires a little improvement, although at this time of the year a firm texture is difficult to obtain; for in the spring of the year, when cows are grazing on

young grass, the butter naturally contains less of the solid fats, and more of the liquid or soft fats—which have a tendency to make it naturally soft and oily. This being the case, great care must be exercised in using the butter-worker, also in cooling the cream down as quickly as possible immediately after separating, and churning at as low a temperature as the atmospheric conditions will admit.

The butter-paper used on "Boston's" butter had the appearance of having been put on dry, as it had a tendency to stick to the butter—much more than it should. Some authorities object to wrapping butter in grease-proof paper, which has been wetted; but this all depends on conditions, and if it were possible to keep butter firm and hard from the time it was made and until it reached the consumer, it would matter very little whether the paper was used dry or not. Unfortunately, such is not the case here; so "Boston" will find that the best plan to adopt is to make a weak solution of boracic acid, and dip the butter-paper in

the solution, just before placing it on the butter. This method I find from experience to answer best, especially in hot weather, as it has a tendency to keep the butter longer, and prevents, to a great extent, the paper from sticking.

"Boston" also states that it takes four days for his cream to ripen, and wants to know if this is too long. I should say most decidedly, yes; but it depends entirely at what temperature the cream has been kept, the amount of care exercised in the shape of cleanliness during the milking operations, and the general conditions under which the cream has been ripened. As a rule, cream is nearly

always over-ripe rather than the reverse, and I have frequently asked different butter-makers whether they consider their cream in the right condition for churning or not, and the answer usually given was that they did not consider it sufficiently acid, when invariably it has been too much so. As a guide to "Boston" in the future, it may be assumed that cream kept at a temperature of 65 deg. Fahr. will be ripe enough to churn in 20 hours, and when kept at 60 degrees, in from 24 to 36 hours.

E. O. CHALLIS,
Government Dairy Expert.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of September, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive Work.*			Coal raised. tons, cwt.	
	Above Ground.			Below Ground.							
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Natal Navigation	18	142	136	24	375	79	7	16	0	15,003	5
Elands Laagte	12	18	194	12	175	268	...	...	...	9,761	1
Glencoe	15	150	86	11	315	20	...	6	...	9,134	0
Dundee Coal...	15	14	175	15	143	298	2	27	45	8,965	5
St. George's	13	69	75	9	248	94	1	9	...	8,466	0
Natal Steam Coal	1	6	4	3	230	6	...	...	...	2,574	18
No. 42	4	19	15	3	100	3	...	...	...	2,016	4
Newcastle	4	12	14	4	109	3	10	103	...	1,935	0
West Lennoxton	1	8	12	2	25	35	...	...	...	1,505	11
Central	2	44	7	3	131	5	1	...	...	1,478	18
Natal Merthyr	3	30	4	2	98	5	1	19	1	1,193	11
Ramsay	2	18	10	1	40	35	5	31	12	864	13
Crown	2	11	32	2	29	4	...	...	...	750	0
Durban	...	...	...	...	...	...	58	309	46	463	10
South African	1	8	...	2	22	2	19	94	12	370	0
Hlobane	...	2	...	1	9	...	...	...	...	188	0
Vrede	1	4	...	...	...	...	...	...	...	23	10
Tonkins-Suter ("Johnson's Home")	No return received.						...	...	...
Total	94	555	764	94	2,049	858	104	614	116	64,693	6
Corresponding month, '02	131	419	739	94	1,547	1,094	17	81	60	50,083	7

* Cost charged to Capital Account.

CHAS. J. GRAY,
Commissioner of Mines.

October 8th, 1903.

Return of Coal bunkered and exported at the Port of Durban for the month of September, 1903 :—

	tons.	cwts.
Bunker Coal ...	...	...
Exported to :—	25,303	17
Cape Colony ...	229	19
United Kingdom	9	3
Beira ...	123	15
Canary Islands	906	0
Total	26,572	14

* All Colonial Coal.

Customs House, Port Natal,
October 1st, 1903.

(Signed) GEO. MAYSTON,
Collector of Customs.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.
- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.
- No. 66a.—Australian of Scottish parentage, 38 years of age and has been in close touch with farming in Australia. Has had large experience of wattle growing.
- No. 67a.—Welshman, aged 27. Was overseer on a sugar estate in Demerara. Understands the cultivation of sugar, bananas, rice, and certain tropical fruits. Is anxious to acquire local experience, and, if necessary, would be prepared to accept a post, on a month's trial, without pay.
- No. 68a.—Scotchman of 28, well educated; seeks situation on a farm, with light duties; such as overseer, storeman, or tutor. Will give services in return for board and lodging in comfortable home.
- No. 69a.—Englishman, 39 years of age, who has had extensive experience in stock and agricultural farming in South America and New Zealand, is anxious to get on to a large and up-to-date farm in Natal, to acquire local experience. Produces good recommendations.
- No. 70a.—Correspondent writes from Johannesburg that he would like to obtain light employment on a farm for about twelve months. Is prepared to pay a premium, if necessary.

The first district of France in which the late M. Pasteur's method of vaccination for anthrax was tried on a large scale was that of Chartres (Eure and Loire Department.) In 1882, upwards of 80,000 sheep, 4,500 cattle, and 500 horses were vaccinated. A local veterinary afterwards reported that of the sheep only 518 died, or little more than one sheep in every 200, whereas the usual death-rate in previous years had been 7,137, or about 9 per cent. Several flocks of sheep were only partially vaccinated, and among these the mortality was fifteen times greater among the unvaccinated than those which had been treated. Among the cattle the death-rate was reduced by vaccination from 7 per cent. to one-fourth per cent.

HEREFORD BULL.



FIRST PRIZE ROYAL SHOW, ENGLAND, 1902.

Exhibited by W. T. Barneby, Saltmarshe, Bromyard.

(See *Article*).

By the courtesy of Messrs. Cooper & Nephews

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER	FARM.
I. A. Trenor	Alfred	Scab	Umpapu	Location
		"	Gelatu Duly Um-	Location
		"	banjana	Whetherby
		"	R. Mack	
W. Gray	Upper Tugela, South	Scab	W. P. Gray	The Heff
	of Tugela River,	"	C. M. Pretorius ...	Strydpoort
	and Estcourt,	"	J. vander Westhuysen	Misgunst
	North of Bush-	"		
	man's River ...	"		
A. H. Ball	Weenen	"	T. Hair	Gretna Green
		"	S. C. Van Rooyen	Middleburg
		"	C. Van Rooyen ...	Scottsburg
		"	Mrs. P. Lotter ...	Schottspoort
E. Varty	Umvoti, Western	"	J. G. Nel	Elladale
	Portion	"		
G. N. Perfect	Umvoti, Eastern	"	W. H. Mayne ...	Mistley
	Portion	"	Baletshe	Matimatolo
C. J. van Rooyen...	Krantzkop	"	L. J. Nel	Diepfontein
R. J. Raw	Impephle	"	S. Faber	Virginia
		"	E. Allborough ...	New Forncett
		"	Geshla	Impephle Location
		"	Makekwana	"
		"	H. Hill	Coquidale
C. Swales	Umlazi	Lungsickness	P. J. Field	Richmond Farm,
		"	Native, Sam Fawkes	near Pinetown
		"	John, & Mr. Kirk	Assegai Kraal, near
		"	Miss Scott	Betha's Hill
A. Hair	P.M. Burg City and	Scab	Umbabana	Umlazi Location
	Umgeni			Glenugi, New Ger-
				many
				Zwartkop Location
E. G. Clerk	Newcastle	Lungsickness	Dundu	Styl Krantz
		"	S. W. Reynolds ...	Newcastle T. Lands
A. J. Marshall	Dundee	Scab	S. M' Lief	Greenock
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gunena ...	"
		"	J. H. Hatting ...	Hattingsvale
		"	P. H. Marshall ...	Cleveland
		"	D. Meunmann ...	Hazeldean
		"	J. A. Landman ...	Boschfontein
		"	F. saw Kumalo ...	Clifton
C. E. Walker	Umsinga	Lungsickness	W. H. Boshoff ...	Pomeroy T. Lands
		Scab	Mfietela	Mazaliego
		"	Umshakoma Qutu	Vermaak's Kraal
		"	C. J. de Villiers ...	Vermaak
		"	Umgota Mbata ...	Mumbe
		"	P. R. N. Vermaak	Balgownie
		"	S. J. Vanderwest-	Pomeroy
			huyesen	
J. Chaplin	Klip River	"	S. Schoeman ...	Maritz Drift
		"	P. Nicholson ...	Hobaland
		"	W. Leathern ...	Glydesdale
		"	P. K. Dalebont ...	Maggiesdale
		"	J. L. Marais ...	Meyer's Hoek

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
J. Chaplin ...	Klip River ...	Scab	D. P. Conradi ...	Meyer's Hoek
		"	A. J. Marais ...	Waterfall
		"	Stomoko ..	Blauwbank
		"	J. Stomoko ...	Reit Kuil
		"	Botchu Luchaba...	"
		"	Umboishwa ...	Vlaakplaats
		"	Thompson and Natives ...	Doornkloof
		"	P. H. de Villiers	Good Hope
		"	J. Bardner ...	Brakwaal
		"	Umveli ...	Stockville
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	S. Sharratt ...	Klein Waterfall
		"	J. Reed ...	Fairfield
R. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	P. Uys ...	Blood River
		"	M. Gregory ...	Frischegwald
		"	H. Potgieter ...	Rooipoort
		"	— Engelbracht ...	Spitzkop
		Lungsickness	H. Beukes ...	Roodekop
		"	P. H. Nel ...	Blauwstroom
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe .	Emyati
		"	Sikwata ...	"
		"	L. Botha ...	Waterval
		"	Ndotyane ..	Rustplaats
		"	Hawse ..	Kromellenbourg
		"	J. R. Steenkamp...	Rustplaats
		"	G. H. Steenkamp	Bloemhoff
		"	W. Pretorins ...	Denny Dalton
		"	Z. de Jager ...	"
		"	W. Havermann & Kun	Langfontein
		Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Inkunya ...	Tweefontein
		"	Nqume ...	Vredehof
		"	Jonas ...	Bloemendal
C. T. Vaughan ...	Paulpietersburg ...	"	Ndanuse ...	Uitval
		"	J. Vanden Heever	"
		"	Mcatu ...	Haasfontein
		"	W. Craig ...	Frischegewaagd

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P. V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni				
Districts ...	...	...	1 for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	...	1	"
" North of White Umfolosi and Umfolosi Rivers	...	...	—	"
Total	...	2	0	

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkandhla, and Entonjaneni Districts.

Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 14th October, 1903.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of September, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).			RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.
	Maximum.	Minimum.					Fall.	Day.	
Central Experiment Farm (Manager)...			98	31	·09	3	·05	9th	1·35
Estcourt			91	31	·24	1	·24	26th	1·62
Nottingham Road (C. J. King)	·22	4	·08	11th	2·13
Adamshurst (Wm. Adams)			94	43	·07	2	·04	18th	1·37
Hilton (Henry V. Ellis)			96	39	·28	4	·13	3rd	2·06
P.M., B. Town Bush Valley (Wilkinson's Nursery)	·76	5	·34	17th	2·47
Ixopo, Gorton (Chas. Green)			90	42	·03	3	·02	18th	·03
Mid illovo, Ismont (A. N. Montgomery)			91	45	·01	1	·01	17th	1·88
Mount Edgcombe (Natal Estates)			97	47	·21	4	·07	16th	2·70
Cornubia	·23	...	...	...	3·01
Milkwood Kraal	·61	...	...	...	1·88
Blackburn	·43	...	...	...	2·44
Saccharine	·15	...	...	...	2·14
Prospect Hall	·27	...	...	...	2·66
Clairmont (J. R. Blamey)	·49	3	·29	4th	3·81
Equeefa (W. Hawksworth)			97	51	·11	3	·08	4th	2·76
Umzinto, Beneva (E. W. Hawksworth)	·07	1	·07	3rd	2·86

District Reports.

MAHLABATINI, 2nd October.—The month has been an exceptionally dry one, with north winds prevailing. The last five days of the month registered 91, 92, 96, 102, 98. Slight mists fell on the 4th, 7th, 10th, and 15th, the total moisture (it cannot be called rain), registered was 21. There is absolutely no grass for stock, and yet, strange to say, they are looking well. Several fresh cases of Rinderpest were reported, and were promptly attended to by the local inoculator, Mr. T. E. Chapman, with the result that the disease was checked with small loss. Two cases of "dik-kop" occurred at the Magistracy, both proving fatal. The disease was contracted in the low country on the Black Umfolozi. During the early part of the month the Magistracy was visited by one of the largest swarms of locusts I have ever seen. It being wet, and intensely cold, the whole swarm settled on the Magistracy trees, giving them for all the world the appearance of dried-up trees. I immersed a good many of the locusts in locust fungus water, with, I believe, good results, as the swarm has not since been heard of. Mealies are still being sold in large quantities at £2 per bag, and Natives are beginning to part with their cattle; but the demand for the latter, owing to the African Coast Fever scare, is very small and cattle that would have fetched £10 apiece a few months ago, are now going begging at half that figure. In fact, nobody will buy. If we could have the benefit of the Natal market, I have no doubt prices would

be considerably advanced; but our only market is Eshowe, and that has been overdone. The water famine is getting very serious, the nearest available water being six miles away. Four oxen were supplied by the Public Works Department for carting water for the Residency, Police, and Gaol, but they cannot possibly cope with the demand, it taking a day to cart a load. Unless four more oxen are supplied soon, life at the Magistracy will be impossible. We have long since given up looking, or praying, for rain.

A. J. S. MARITZ, Magistrate.

NEW HANOVER, 12th October, 1903.—After the welcome but totally inadequate rainfall which I mentioned in my last report, a period of drought has once more set in, which is becoming a source of serious trouble to farmers and the Natives. It is hoped, however, that all the heat which has been experienced during the last month will bring on sufficient rain for farmers to start their ploughing. Heavy and dry winds are continually blowing. Swarms of locusts have passed in the Division. The live stock, on the whole, is poor in condition. No disease of stock has been reported. Meat and all kinds of agricultural produce are scarce.

A. RITTER, Magistrate.

EMPANGENI.—The weather was terribly dry during the past month. Hot north winds prevailed for 23 out of the 30 days thereof. Only slight showers of rain fell during the

nights of the 2nd and 17th, and on the 3rd, 9th, and 13th. Only one death among stock was reported: that of one out of 100 head of Madagascar oxen, belonging to Government, and placed in the Empangeni quarantine area for grazing purposes. It sank in attempting to cross the Empangeni Swamp, and was suffocated. Whereas, stock appear to flourish owing to the very dry weather, other things suffer, e.g., Native residents in the Sokula location, towards St. Lucia Bay, complained of the increase and virulence of the "jigger-dlea;" and the parched state of the young crops throughout the Division is much lamented. So low have many of the permanent pools of water in the immediate vicinity of the Magistracy become that fishing lines are not required to catch barbel, perch, or bream. The proper watering of flowers, or kitchen garden, trees, and shrubs is impossible, unless residents devote nearly the whole time of their servants in carrying water for such purpose, in addition to what is required to wash themselves, their clothing, etc. It is to be seriously hoped that South Africa is not going to exchange climates with Australia for the next five years; the drought of last year and this would appear to indicate such a catastrophe.

A. R. R. TURNBULL, Magistrate.

HOWICK, 2nd October.—Since writing my last report no rain worth mentioning has fallen, and consequently the country looks very brown. We have experienced numerous hot north easterly gales during the month which have completely changed the aspect of the District, which, as stated in my last report, was beginning to acquire a more cheerful and spring-like appearance. In fact, as a result of last week's excessive heat and hot winds the farmers experienced some difficulty in even keeping their stock alive, and I am told that should the dry weather continue farmers in the upper parts of the country will have to send their stock to lower lying districts for grazing. On Friday, the 25th ult., the locusts made their appearance in the village, but I am glad to say they did not make their stay a long one (they evidently did not find it worth their while.) I have, however, been given to understand that they have left the district altogether. The Natives have already begun to plough and plant in spite of the scarcity of rain, but I very much doubt whether their efforts will be crowned with great success. No cases of any serious disease among the stock have been brought to my notice during the past month.

J. W. CROSS, Magistrate.

EMPANDHLENI, September, 30.—The weather has been most unpleasant throughout

the month; incessant winds, and the last week exceedingly hot. The maximum temperature was 91 degrees, the minimum 35 degrees, and the total rainfall .35 inches. The demand for mealies is the same, and the prices have not, as yet, been lowered by the local storekeepers, being still between 32s. 6d to 40s. per muid. The Natives are all busy planting, but if this drought continues the seed now sown will be wasted, as what is coming out of the ground is being scorched up. The locusts have been reported; rinderpest is much the same; if anything, on the decrease. Mr. S. W. Cooper, Inoculator, is busy inoculating; the total deaths for the month being 36 head. A young horse, the property of Dr. J. A. Kennedy, died on the 19th inst., from what appeared to be dikkop (horsesickness.) A pack of wild dogs made their appearance in this neighbourhood on the 24th inst.: five were killed, the remainder dispersed towards the White Umfolozi thorns. Little damage was done. Bad colds have been prevalent, otherwise the health of the Division has been good.

C. C. FOXON, Magistrate.

BULWER, October 9th.—The weather the last fortnight has been most unfavourable; all hopes have been shattered of the wet season setting in. Yesterday, after a scorching hot day, the previous day was icy cold, and I fear frost fell in some parts of the Division. I regret to have to report a serious loss of cattle by Mr. W. J. B. Stone from tulip, near the farm Sterling, the property of Mr. William Wilson. The herd of cattle was being received from the Ixopo Division, where they appear to have been wintering, to the owner's farm in Underberg Division, and on the way were allowed to graze during the night on a piece of land near Mr. Wilson's residence covered with tulip, and being hungry after the day's journey ate considerably of this poisonous herb with disastrous consequences. It was reported that 10 head were dead, and the whole troupe of about 80 head were more or less bad. Several cases of gall-sickness and vegetable poisoning have been reported within the last few days. I see Dr. Theiler in the "Transvaal Agricultural Journal," refers to certain symptoms in red water cases in the Transvaal with respect to the exudation of blood in the skin, and through the pores of the flesh, as soon as the beast is skinned. This is also the case in Natal and seems to me one of the prominent features of the disease, and I have also noticed that the blood is of a pale colour as though it had been mixed with water, and then smeared over the skin. It would be interesting to know whether the disease is as severe with all classes of stock, that is, seasoned or well climatized stock, or recently

imported stock, or stock obtained from other parts of the country. It would be as well to ascertain this as there seems to be a consensus of opinion among some of the old stock farmers that the new type of red water in Rhodesia, and up north, is the same disease we have had in Natal for many years, and

swept off so many cattle years ago. I have nothing to report with regard to cultivation as everything is at a standstill for want of rain. As regards sheep and horses I have nothing to add to my last report.

H. W. BOAST, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—From all over South Africa comes the same doleful tale of drought. Not only is Natal confronted with the same difficulty, but the Transvaal, Orange River Colony, and the Cape are all suffering terribly from the scarcity of rain. Doubtless the shortage of rain last summer is the main cause of rivers ceasing to flow, but one has only to go back a few years in the history of this Colony, and one hears of very little rain falling until the middle or end of October. The writer knows that in 1874 little or no rain fell from the 25th of April until the 1st of November; and, doubtless, if authentic records were forthcoming, one would be confronted with the fact that South Africa has passed through times quite as trying. As communities increase in number, and more towns and villages spring into existence, the matter of water will become a most serious problem. Not only will municipalities have to face how they are to supply the towns under their management, but Governments will be forced to step in and inaugurate systems for irrigation.

Mealies.—American Mealies are now almost exclusively used; in fact, the less said about Colonial grain the better. The prices in Durban are about the same as we last quoted, viz., 14s. to 16s. per muid; duty paid, for White North American; and 11s. to 13s. per muid for White South American. There is a heavy demand for Colonial seed mealies.

Forage.—There is a quantity of forage offered daily; unfortunately, the bulk of what is being offered is almost green. Prices have fluctuated between 5s. and 7s. per 100 lbs.

Hay.—Good hay is in demand; unfortunately, much that is offered is not first-class, and whilst some samples have been down to 1s. 1d. per 100 lbs., others have reached 3s. 4d. to 3s. 6d. per 100 lbs. Bedding 7s. to 14s. per load.

Potatoes.—The supply at present is small, and prices have varied between 9s. 9d. and 23s. per 100 lbs. There is a quantity of imported sold, and table potatoes are now coming forward.

Onions.—The market is better supplied, and prices have ruled between 8s., 13s., and 20s. per 100 lbs.

Poultry.—Common fowls 2s. 7d. to 4s. 3d. each; geese, 7s. each; turkeys (cocks), 20s. to 25s. each (hens), 9s. 9d. to 10s. each.

Butter.—The market is fairly well supplied, and prices have varied between 1s. and 2s. 1d. per lb.

Eggs.—Supply is good, and prices have varied between 1s. 4d. and 1s. 8d. per dozen.

Sundries.—Bacon, 6d. per lb; pork, 6d. to 7d. per lb.; mutton, 9d. to 1s. per lb.; trussed fowls, 2s. 9d. to 3s. 9d. each; rabbits, 1s. to 2s. 6d. each; and a numerous variety of articles which sold to ready customers.

Fruit.—Very little offering, oranges, nartjes, papaws, bananas, and pineapples being the varieties disposed of.

Vegetables.—Cabbages, peas, carrots, celery, French beans, broad beans, onions, lettuce, tomatoes, and turnips.

Firewood.—From 4½d. to 9d. per 100 lbs.; cut, 10½d. to 11d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade shows little sign of any improvement, and the prevailing depression is universal in South Africa.

Mealies.—The market is firm owing to the enormous quantity of sweated grain from South America, and good qualities are, in consequence, in request. Sound grain is worth 12s. per 200 lb. in bond for South American, and 14s. for North American.

Potatoes.—Stocks are very low, and good Early Rose samples bring as much as 25s. per muid of 150 lbs.

Forage is in poor demand; sellers ask 9s. 6d. per 100 lbs., but there are few buyers.

The prevailing drought is militating against the sale of seeds, and it is to be feared that owing to the absence of encouragement importers will be short of stocks later on. Farmers would be well advised to order early.

JOHANNESBURG.—Mr. Thomas' special report has not reached us for this issue.—The Australian Produce and General Agency, Johannesburg, report under date October 10th as follows:—

Only a slight improvement is noted in grain at the coast, and the local market is depressed in many lines. The continued dry weather is serious.

Potatoes (163 lbs).—Prices, imported—Best Early Rose, 27s., 30s.; whites, 22s., 25s.; East Coast, £12 per ton, F.O.R. Delagoa Bay; Canary Kidneys, 10s. 3d. per 100 lbs., F.O.R. Durban; Hungarian, 9s. per 80 lbs., C.I.F. Durban; Australian Red Skins, 11s. 3d. per 100 lbs., F.O.R. East London.

Seed Potatoes.—French Early Rose, 8s. per case (75 lbs. gross), F.O.R. East London; ditto, 12s. 6d. spot; ditto, November delivery, 7s. 3d., 8s., F.O.R. East London; Early Rose Seed, in 100 lbs. case, 9s. 6d., F.O.R. Durban; other varieties to sample, 8s. 6d., F.O.R. East London; ditto, 12s. 3d., spot.

Sweet Potatoes.—16s., 18s.

Onions (125 lbs.).—Best Colonial, 17s. 3d., 22s. 6d.

Fowls.—3s. 6d., 4s. 6d. (large); 2s. 3d. (small.)

Turkeys.—10s., 21s. (cocks); 10s. 6d., 13s. (hens.)

Ducks.—6s., 7s. 6d.

Eggs.—Local new laid, 2s. 3d. per dozen; Colonial guaranteed, 1s. 3d., 1s. 6d.

Meat (203 lb.).—East Coast whites, 16s. 6d., 17s. 6d.; South American yellows (200 lb.), 19s.; Chai Chai, 16s.; South American whites 13s. 6d., 14s., F.O.R. Durban (bond); North American whites (200 lb.), 13s., F.O.R. Durban, bond; ditto (100 lb.), 6s. 2½d., C.I.F. Durban; South American whites (100 lb.), 4s. 10½d., C.I.F. Durban; South American yellows (200 lb.), 8s. 10½d., F.O.R. Durban, bond; ditto (100 lb.), 4s. 9d., C.I.F. Durban.

Rye (203 lb.).—20s. 6d.; North American, 7s. 6d. per 100 lb., F.O.R. Durban, bond.

H'eat (203 lb.).—25s., good Colonial sample.

Forage (100 lbs.).—Over-supplied. Best Colonial, 7s. 6d., 9s. 6d.; seconds, 5s. 9d., 7s.

Lucerne.—Argentine, 9s. 3d. per 90 lbs.; 9s. 9d. per 100 lbs.; 4s. 6d. per 100 lbs., F.O.R. Durban, bond.

Pound Notices.

THE following stock, unless previously released, will be sold on the 18th November next:—

Dannhauser.—Grey mare, branded P—, right hip broken. Impounded 16th September. Seven sheep, branded J— O M. Note.—The bay mare, advertised in the *Government Gazette* of the 8th September, 1903, to be sold on the 21st October, 1903, should be described as follows:—Dark bay mare, white star, left hind foot white, lame in right shoulder, no brands.

Greytown.—Yellow cow, small square cut top left ear, point off right ear, and small slit in front right ear, branded looks like W N on right buttock, heavy in calf, marks on both hips, aged.

Running on Mr. C. Morton's farm, "The Store," Riet Vlei.—Black-and-white ox, about 2½ years old, branded JB or JF on right side, swallow tail on right ear, stump tail.

Erin, Dronk Vlei.—Small black-and-white cow.

Mooi River.—Running on the farm, "Easingwold," on the 1st October, 1903.—Bay gelding; large white star on forehead, off hind and off fore fetlocks white, long tail, shows a little cart blood, no brands visible.

Boston.—One grey gelding; no brands visible; sore back; covered with mange. Worth about £5. Impounded by Native Police on 28th September.

Howick.—One bay pony gelding, humped back about four years old. One bay gelding, black points, about 15 hands, shod all round, triangular brand on left hip, manged neck. Two red-and-white oxen, about five years old, brands indistinct.

Pietermaritzburg.—A small red-and-white yearling heifer, lower half of tail white, horns about two-and-a-half inches long, no brands visible.

Highbury.—One black goat ram, probable value £1, impounded on September 29th by

Pwiji, Native. The above animal will be sold at the expiry of one month from this date (30th September) if not previously released.

Greytown.—The description of the black-and-white yearling ox, with wide spreading horns, reported by Mr. M. Norton as too wild to be driven to the Greytown Pound, advertised in *Government Gazette* of September 22nd, 1903, should read thus:—Black-and-white yearling bull, with wide spreading horns. Impounded on 15th September, by A. W. Wright, Trooper, N.P. The above animal will be sold at the expiry of one month from this date (3rd October) if not previously released.

Dannhauser, 1st October, 1903.—One ram, branded T.M., probable value 15s. Impounded August 24th, by Mr. Taffel. The above animal will be sold at the expiry of one month from this date (1st October) if not previously released.

Hope Farm, Newcastle.—Red two-year old bull, lame near hind leg; probable value, £10. Impounded October 5th, by A. Osborn. The above animal will be sold at the expiry of one month from this date (6th October) if not previously released.

Jackal Spruit, Klip River.—Black Bull, about three years old, white mark on off hind leg, and little white on dewlap; no brand visible. Probable value, £5. Impounded 1st October, by D. C. Odendaal, Venter's Hoek, near Bester's Station. The above animal will be sold at the expiry of one month from this date (1st October) if not previously released.

Thornville Junction.—Bay stallion, black points, about 14 hands, small notch out of right ear, had saddle and bridle on when impounded; probable value, £10. Impounded 7th October, by Natal Police. The above animal will be sold at the expiry of one month from this date (7th October) if not previously released.

Stock Diseases Proclamations in force.

PROCLAMATION No. 100, 1897.

The penalty for any contravention of Law No. 13, 1866, or of Acts Nos. 38, of 1894; 1, of 1896; 34, of 1896; and 3, of 1897; or of any Act to be construed therewith, or of any Proclamation which may be issued thereunder.

PROCLAMATION No. 43, 1900.

Principal Veterinary Surgeon, under Section 15 Animal Diseases Act, No. 38, 1894, empowered to prohibit any cargo or portion of cargo, or any article of whatever nature from being landed.

PROCLAMATION No. 34, 1902.

Under Section 15 of the Animals' Diseases Act, 1894, the removal of cattle from infected areas prohibited.

PROCLAMATION No. 54, 1894.

Importation of dogs into Natal prohibited except under certain conditions.

PROCLAMATION No. 8, 1901.

Regulations under Lung sickness Act. Cattle allowed to leave an infected area upon written permission from Principal Veterinary Surgeon.

PROCLAMATION No. 59, 1901.

Cattle from Basutoland prohibited from entering Natal.

PROCLAMATION No. 29, 1901, and 52, 1902.

Zululand declared an infected area. No cattle allowed to leave or enter that Province.

PROCLAMATION No. 46, 1903.

Cattle allowed to enter Zululand upon permit from Principal Veterinary Surgeon.

PROCLAMATION No. 3, 1903.

Transport oxen from Nqutu district allowed to go to Dundee for supplies under certain conditions.

PROCLAMATION No. 98, 1901.

Cattle from Transvaal prohibited from entering Natal.

GOVERNMENT NOTICE No. 506, 1901.

Any part or parts or any material prepared with or from animals affected with or having died from Rinderpest may not be introduced into Natal nor be removed from one place in Colony to another, except under written authority from Principal Veterinary Surgeon.

PROCLAMATION No. 36, 1902.

Importation of cattle prohibited from following countries:—The Colony of Rhodesia; the State of Queensland in the Australian Commonwealth; and the States of Texas and Louisiana, in the United States of America.

PROCLAMATION No. 42, 1902.

Proclamation 36, 1902, extended to all ports along the coast line of the United States from New Orleans to Charleston, inclusive.

PROCLAMATION No. 71, 1902.

Importation of cattle prohibited from all States of the Australian Commonwealth.

PROCLAMATION No. 15, 1903.

Cattle from East Coast of Africa prohibited from being imported into Natal.

PROCLAMATION No. 25, 1903.

Certain areas—Zululand and districts of Vryheid and Paulpietersburg declared infected areas on account of Rinderpest.

PROCLAMATION No. 63, 1903.

Importation into Natal of cattle, sheep, goats and pigs from Argentine prohibited.

PROCLAMATION No. 77, 1903.

Importation into Natal of horses, mules and cattle from Mauritius and India prohibited. Under certain conditions animals from India may be imported into Natal.

PROCLAMATION No. 79, 1903.

Portion of Ingwavuma district, Zululand, declared an infected area.

Weekly Rinderpest Report up to 13th October, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 26th May, 1903 to date.
<i>Zululand.</i>			
Eshowe District	7	17	281
Umlalazi District	5	7	182
Nkandhla District	6	5	290
Mahlabatini District ...	...	...	110
Entonjaneni District ...	...	...	12
<i>Vryheid District.</i>	3	14	204

13th October, 1903.

M. J. HINE,
for P. V. Surgeon.

The Agricultural Journal

AND MINING RECORD.

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African Coast Fever.

DR. KOCH'S THIRD REPORT.

PUBLISHED in this issue is Dr. Koch's Third Report on African Coast Fever. As in the previous Reports which have already appeared in the *Journal*, that which is now made public is indicative of capable, diligent, and painstaking research.

Research by so eminent a man as Dr. Koch is in bacteriology, despite a few mistakes in a long career, has a conclusiveness of its own, and in consequence there is but little hope that his unfavourable conclusions may prove erroneous. The Report is what it purports to be—an

account of various groups of experiments, conducted on principles established by the late Pasteur, who, practically, it may be said, was the discoverer of the bacterial science of the present day.

TICKS.

That ticks are the transmitters of the disease is now well known. Dr. Koch shows that from the eggs of infected ticks—ticks which have lived on cattle having the parasite of the Coast Fever—are disease-bearers. So far, he makes no

allusion as to limits in generations of these disease-conveying tick progeny. It is to be hoped that the evil ends with the first generation, which in itself is sufficiently bad. Of these young ticks of various kinds he artificially hatched large quantities from eggs in incubators, and then placed them on a certain piece of veld. The young ticks remained almost stationary, only climbing to the ends of blades of grass, so as to easily attach themselves to passing animals. The piece of veld became a most valuable test ground, for no susceptible, that is to say clean, animal could be placed on it without promptly getting Coast Fever.

SERUM AS A CURATIVE.

The serum experiments were of great scientific interest. Injected into healthy animals in large doses, serum—the thin, watery fluid of blood—produced no effect, but injected into sick animals, the disease was at once checked. After a few days, the fever parasite disappeared, but with this unfortunate sequence—the composition of the blood was destroyed. Very small doses in the earliest stages were occasionally successful, but the hopes at first raised as to its proving a serviceable curative agent were disappointed.

SERUM AS A PREVENTIVE.

Serum was also tried as a preventive. In this respect it also proved practically a failure. In most cases sickness and death were not stayed after the inoculated animals had been placed on the piece of tick-infested veld already referred to. In a certain case, however, with serum from one particular beast, three out of six inoculated animals were successfully immunised. Better results might, Dr. Koch thinks, have been obtained had the serum been prepared in a manner for which, up to the date of his Report, there was not time to produce it. Further, he says that in the course of the work it was found that they had to reckon with “a complicating factor which interfered most materially with any satisfactory application of serum treatment; this factor is the occurrence of Texas fever complications. Texas fever, or redwater infection, I have found in the course of our experimental work here, is much more widely disseminated in Rhodesia than I at first suspected; in fact, to such an extent does it exist that we need not be at all surprised

if any Rhodesian animal develops an acute attack of Texas fever or redwater when attacked by any febrile disorder of a debilitating nature.”

Presumably we imagine the results would be more favourable in localities where redwater is not endemic.

HOW TO COMBAT THE DISEASE.

With reference to the best methods of fighting the disease, Dr. Koch makes certain propositions, and severally discusses their *pros* and *cons*. Stamping out he regretfully abandons as being impracticable under South African conditions. He comes to the conclusion that the best means of combating the disease under the present circumstances is that of immunising by the inoculation of recovered blood, which process, he says, is devoid of risk and is inexpensive.

“For the present,” he says, “I advise that it be only applied to animals exposed to imminent risk of infection, to infected herds and to animals running on infected pastures, particularly to herds in which isolated cases of the disease have only recently occurred.”

“The best results,” he is of opinion, “will be obtained by using freshly-drawn defibrinated blood from recovered animals which are in good condition. This blood should be injected subcutaneously into each animal which it is desired to protect in a dose of ten cubic centimetres, and the injection should be repeated four times, with an interval of seven days between each injection. Afterwards, 10 c.c. doses should be given for some time every two weeks, and later a dose once a month should suffice.”

At the end of the Report full instructions for the process of inoculation will be found.

In the foregoing we have attempted only to give the salient features of the practical bearings of the Report. They may be roughly summed up thus:—Keep the cattle as free as possible from the transmitters of the disease—ticks (and especially the ticks of redwater districts), and where the disease breaks out, and in its vicinity, inoculate for immunising with recovered blood.

Those who have the time and inclination to read the Report in its entirety will find in it much of general and scientific interest.

Sub-Irrigation.

OUR correspondents, Messrs. Caldecott and Browning, ask for information regarding sub-irrigation. Theoretically this system of irrigation is the best of all, but unfortunately, the practice is so surrounded by difficulties that it cannot be recommended for general adoption. All authorities, it may be said at once, agree that plant life succeeds best where there is a free, constant and uniform moisture diffused from below the surface of the soil. In surface irrigation the roots are deprived of air for a couple of days or so; with sub-irrigation, on the other hand, the air supply is not cut off, the surface remains loose and fine, and the temperature is but little altered.

SEEPAGE.

Every irrigator should know how far water penetrates his land downwards and laterally, and this knowledge is indispensable for the sub-irrigator. Sub-irrigation by seepage or soaking is the most advantageous of the various systems if the conditions are favourable. It is simple and the cost is small. The essential conditions are sloping land with clay bottom at about two feet deep. A series of parallel ditches, varying in distance from each other, must be cut according to the slope of the land. They have to run with the horizontal contour of the land. The water is let into the top ditch and is allowed to remain there until it has penetrated the surface soil up to the second ditch. Then, by opening a gate the water is allowed to flow from the first ditch into the second, and after the land lying lower has been saturated, the third ditch is filled, and so on till the last is reached. The bottom ditches should be at greater distances apart than the upper, because from the higher ground there will be soakage even after the supplies have been cut off. Across the middle of the ditches running down the hill is made the channel which leads the water into the successive catches.

PIPE SUB-IRRIGATION.

Pipe sub-irrigation is theoretically the best of all the plans, and if porous pipes

are used, such as may be made by an admixture of sawdust, the ideal plan of scientists is attained. These pipes, according to the nature of the soil, are laid about eighteen inches deep, and in lines from about five to twenty feet apart. A fall of 1 in 200 is necessary. The cost, where trained white labour is procurable, amounts to about £80 per acre, if the greater distance apart be elected. For vegetables the distances apart should be small, and for orchards, it is sufficient, as a rule, to take the pipes between alternate rows of trees at a depth of ten or twelve inches.

GRAVEL TRENCHING.

This plan proves successful and cheap under certain conditions. Trenches, about 8 inches wide, and 2 feet deep are cut on a hillside as described for seepage. The trenches are filled from 6 to 8 inches with any kind of stones, and are then, as in small stone drains, filled with earth. These trenches will be found to act as reservoirs, and the water they accumulate will soak down the hill side in the surface soil as in the seepage system.

A considerable number of authorities have been consulted for writing the foregoing. For further information we would refer those interested to "Irrigation Farming," L. M. Wilcox; Orange Judd Co., New York; "Irrigation and Drainage," F. H. King, Macmillan, London; and "Les Irrigations," A. Rona, Firmin Didot et Cie, Paris. In Europe generally there is but little demand for irrigation, drainage being the chief requirement. In Stephens' very comprehensive and well-known work on farming there is no reference to sub-irrigation. Alderman Mechi, who lost a fortune in farming which he had made in the sale of razor strops, if we remember rightly, experimented in supplying liquid manure by underground laid pipes. In some of the market gardens in the Thames valley sub-irrigation has been tried, and again, if we remember rightly, the experiments were not successful.

Passing Notes.

MODEL OF NEL'S RUST DIP.—During the Farmers' Conference an admirable model of the Nel's Rust Dip, executed by Mr. George D. Alexander, was on exhibition. The model is now at the office of the Government Entomologist, and may be seen on application. To many people models are more self-explanatory than plans, and such people, if they are intending to erect a dip, would do well to inspect it. In every respect the model reflects credit on Mr. Alexander, in public spirit, workmanship, and application.

NEW PLAN OF NEL'S RUST DIP.—The Veterinary Department is having lithographs made of a large working plan of the Nel's Rust Dip. The plan is drawn by Mr. George D. Alexander, and is practically the same as that which he was good enough to draw for the *Journal*, which was published in No. 11, Vol. V. It may be convenient to point out again that in the plan we published there were several minor errors. The dripping yards were called "dipping" yards, the gate at the end of the race was swung wrongly, and the scale of the sliding gates and post was not correct. According to the scale the gate was $3\frac{1}{2}$ feet high. This last mistake was due to the impossibility at that time of getting in the Colony a photo-engraved block of the necessary size. These small mistakes in the adjuncts to the dip, regrettable as they were, were obvious to every practical man. Happily, with regard to the dip itself, the yards, the crush pen, race, etc., there was no chance for any one having even the smallest aptitude for construction to make a mistake, the necessary dimensions having been given in figures.

BASIC SLAG.—In his "Further Report on Manure Experiments" at the Central Experiment Farm, which appeared in our last issue, the Director of Agriculture showed the excellent relative value of slag as compared with bone

dust. He says:—"It will be seen from the above (table) that the effect of the bonedust was exactly the same as that of the slag. To be worth buying, bonedust ought, therefore, to be purchasable at the same price as slag, namely, at £4 7s. per long ton, instead of £6 16s." Evidence of strong character in this respect was given in No. 9, Vol. III. Experiments conducted by Messrs. G. & B. Hutchinson for the Lion's River Agricultural Association showed even a small advantage in crop returns for the slag. Bonedust in an equal quantity gave only $14\frac{1}{2}$ muids to the acre, in comparison with 15 muids given by slag. It is strange, indeed, that the superior cash value of slag is not universally recognised by this time. Probably the explanation will be found in the remarks of the Director of Agriculture:—"Bonedust is at the present day existing to a great extent on the reputation it gained many years ago, before the introduction of superphosphate and slag."

JUDGING AT SHOWS.—The articles and correspondence which recently appeared in the *Journal* will still be fresh in the memories of most of our readers. The following extract from an editorial article in *The Station, Farm, and Dairy*, New South Wales, of the 14th ult., echoes, it will be seen, the views we expressed:—"If a show is not agriculturally educational in the best sense of the term it is a delusion and a snare. Visitors merely looking at the exhibits and the tickets with no guiding information, especially for the youthful portion, soon weary and seek a change round the ring or at the side shows. Those who are not present when the judge is giving his reasons for the awards should have the opportunity of reading the reasons on a card attached to or alongside the exhibit."

NOMENCLATURE.—As may be supposed the question of how to designate in a

technical publication what writers variously call African Coast Fever, East Coast Fever, Rhodesian Disease, Rhodesian Redwater, Rhodesian Tick Fever, etc., has become a difficulty. All the terms are cumbersome and vague, and it is understood that the Rhodesians see

science in describing a foreign disease which has invaded their country as "Rhodesian." The editorial difficulty has been solved by requesting an official ruling on the subject, and the ruling is, that the disease shall be designated "African Coast Fever."

Carob Tree.

(See Illustration.)

IN this issue will be found a photograph of the carob or locust-bean tree, described in the interview of Ergates with Mr. Fritz Reiche, J.P. Goddard Road, No. 17, Vol. VI. For information about carob tree culture, the reader is referred to the official corre-

spondence between the Hon. Joseph Baynes, M.L.A., and the Minister of Agriculture, Nos. 19 and 20, Vol. V.; the letter of Mr. James Bonar, No. 1, Vol. VI.; and notice as to the seeds, No. 3, Vol. VI.

Loans for the Construction of Dipping Tanks.

SPECIAL attention is called to the notice with regard to Government Loans for the construction of dipping tanks which is published in this issue.

Appended to the above notice is another which draws attention to the Law which deals with compulsory dipping.

"Insects in an Important Role."

ON the evening of the 21st inst. Mr. Claude Fuller, Government Entomologist, read an interesting paper to members of the Farmers' Conference on the above subject. The paper was published in the *Times of Natal* and the

Natal Witness, and as, at the suggestion of the President of the Conference, it will be read again before certain agricultural associations, we forbear for the present from further publication.

Correspondence.

To the Editor Agricultural Journal.

SUB-IRRIGATION.

DEAR SIR,—Can you give us any information on underground irrigation?

We would like to know how it is done, and if it is an improvement on surface

irrigation. A reply through the *Journal* will oblige.—Yours faithfully,

CALDECOTT & BROWNING.

Botha's Pass, via Ingogo.
See Article.—Ed, *Agricultural Journal*.

Himeville Agricultural Society.

ON the 10th inst., at the Underberg Store, Mr. HENRY C. GOLD, the President of the above Society, read his Annual Report before a large attendance of the Society. From the Report we take the following :—

The Show was held on April the 3rd, and was a complete success. The public generally contributed a very liberal support in subscriptions, which goes a long way towards making a successful show, and nearly all classes were well fitted with exhibits, as many as fifteen in the class for brood mares for "Carriage and Saddle purposes," with the result that competition was very keen. Horses all round were excellent, and visitors could not fail to see that Himeville district can produce grand horses for any purpose as much so as any part of the colony. Cattle were plentiful and of good quality, more especially the young stock. It reflects great credit on breeders to present such splendid animals on a show in such nice condition, and almost without any preparation. Mr. Challis, our dairy expert, has been urging every endeavour at all convenient times for farmers to improve their stock, so that they may be something more apparent in the bucket, and I think that he will admit that they are doing what they can, and that to a considerable extent, to follow his advice in the matter. You would notice his statement in the farmers' *Journal*, "that we can never hope to develop a good milch cow as long as we allow the calf to suck." Doubtless this is quite true; everything points that way, the practice at Home, in America, and indeed in all dairy countries, but, so long as we are at the disadvantage of being placed outside a market for want of railways, and as long as cattle remain at present prices, few people, if any, can afford to change their present method. There is no doubt, however, to my mind that Mr. Challis is quite correct, but the class of milch we have here will take a deal of educating up to Mr. Challis's requirements. It is a great pity that our legislators cannot hit upon some way of improving our native labour. The time will come when this question will not be confined to the Transvaal. The native does not progress, so far as my twenty-

one years' experience goes. He was as good a servant then as he is to-day. The ordinary kafir is just as helpless when left by himself to-day as he was then. My own opinion is that the Government ought to encourage boys of 13 and 14 years to indenture to farmers and other employers of labour for a term of five years, and at the end of that term they would know something of the particular work they had been doing, and being a practical hand in whatever he took up he would be a better servant and command a better wage, and in time might renounce this indolent system of three months on and nine months off, for until a native can be brought to work regularly no improvement need be expected.

The rain which fell on the day previous to the show seriously interfered with the sheep section, and while those shown did their owners credit, the numbers were somewhat disappointing in a sheep district. The show of produce and manufactures was very good indeed, considering the awfully dry season. The show being held so early puts exhibitors in this line to a disadvantage while benefiting the stock section as a whole. The question might be considered whether it would not be better to hold the next show a month later, in order to bring the classes together on fairer terms. The public subscribe for the benefit of all in the broad sense, and great care must be taken that one section is not favoured at the expense of the other. Some allowance must be made for the first show.

Most of you will have seen the correspondence in the farmers' *Journal* relating to judging at shows. This to me seems the most important part of all, for on the judging hangs the success or failure of shows, to some extent; and those gentlemen who undertake the responsibilities, often at great inconvenience to themselves, deserve more thanks and consideration than they sometimes get. The editor of the *Journal* states :—"Our sole aim is that of making the giving of reasons verbally or by points an essential feature of judging." I doubt whether men could be found at the present day who would answer the numerous questions exhibitors would be entitled to put to them.

The question of forming an Association of Judges, I hope, may be realised, if only competent men are allowed to become members. Agricultural societies would feel more confident in having awards made by judges from the association.

The last year was, unfortunately for farmers, about as bad as it could well be, both for stock and crops. The mealie crop may be said to have been a total failure, and the grass, usually so abundant in this part, was very scarce at times, and, although the present outlook is anything

but bright, let us hope that this season's crops may, in some measure, make up for the last.

The near approach of Rhodesian red-water is causing some anxiety, another calamity which, I fear, will eventually overtake us, but it is comforting to know that the Government are doing what they can to prevent its entering the Colony, and it behoves every farmer to be ready to combat or prevent it with the best means available.

Abortion in Cows.

To the Editor Agricultural Journal.

SIR,—This subject is one that I feel greatly interested in, as I have lost pretty heavily by it. Last year I think I lost eight or nine, and this year only four. I rather fancy the bull I had for these two years was bad, as many of the calves were very weak at birth, having to be held up to suck for three or four days.

I should recommend anyone who loses in this way, to change the bull. It may not always follow, as this year some of my cows that aborted last year have good calves. It is, however, best to try no experiments; I never sell a cow for only once going wrong. I have an account of a farmer at Home whose cows, to the tune of about 20, all slunk their calves. He sold the bull to a neighbour, who also lost his, and after that took the bull back, and had three cows served by him, which subsequently lost theirs.

I believe there are many causes for

abortion, such as changing the pasture; I have known cows brought from other districts to drop half matured calves. The change undoubtedly stopped the growth of the fetus. Then, I believe some of our pastures contain ergotised grasses and herbs. Driving cattle through narrow gates is often the cause. I had two in-calf heifers that used to do an extraordinary amount of fighting. One of them, some time after, had a slightly deformed calf that soon died. Referring to narrow gates, I sent a number of cattle to winter where they were kraaled. I believe two of them lost their calves during that time. "Sympathetic Contagion" is not so likely in Natal where close contact is rarely indulged in. My cattle were not all running together.

Yours etc.,

CAP.

Poisoning of Stock.

MR. HUTCHEON, Chief Veterinary Surgeon, Cape Colony, in an interesting article appearing in the *Agricultural Journal* of that Colony, deals

with the disorders of the digestive organs of stock, disorders known as "gall sickness," "black gall sickness," etc., which often have a fatal termination.

He refers in particular to the poisonous effects produced by eating tulip, oleander leaves, and wild tobacco. In conclusion, he says:—"But in addition to plants which are directly poisonous to certain animals in their natural condition, it is a generally accepted fact that succulent vegetation, under certain altered conditions, is liable to produce sickness and death amongst stock. The explanation which is given of this change and the manner in which it is brought about is somewhat as follows:—

"The nature of a chemical compound cannot be judged of by the elements which compose it, but by the manner in which these elements are arranged.

"Liebig states the matter thus:—"In chemical combinations the ultimate atoms of bodies do not penetrate each other, they are only arranged side by side in a certain order, and the properties of the compound depend entirely upon this order. If they are made to change their position or mode of arrangement by an impulse from without, they combine again in a different manner, and another compound is formed with totally different properties."

"Judging from analogy, and reasoning from the effects produced, it is believed that rich succulent vegetation, when exposed to the powerful rays of an abnormally hot sun, have their juices so changed that they are no longer wholesome, but

become in some instances positively poisonous.

"The disease known as "Gielziekte" in sheep and some forms of gall-sickness in cattle, and death among geese, are believed by the majority of Colonial farmers to be induced by the respective animals eating rich succulent grasses after they have become wilted by the heat of a scorching sun. In like manner, if juicy vegetables, such as lettuce, are cut and eaten by human beings, after they have been exposed to the hot sun, they frequently give rise to severe constitutional disturbance. It is the same with certain succulent fruits such as pears and tomatoes, if they are gathered and eaten late in a hot day.

"The explanation offered is that when plants are exposed to a higher temperature than that in which they have been produced, the arrangement of their atoms is changed, and the properties of their substance are also changed, so that while in the former arrangement they may be quite wholesome, in the latter arrangement they may become more or less injurious.

"But be the explanation what it may; it is an undoubted fact, that some of the plants which are certified to have produced fatal results in certain animals at particular periods—have completely failed to produce similar results when experimented with directly under different conditions."

Appreciation of Anthracite.

MR. W. J. CUDWORTH, chief engineer on the North-Eastern Railway, who has recently visited the United States, a few weeks ago delivered his inaugural address to the members of the Yorkshire Students' Association of the Institute of Civil Engineers, of which he was recently elected president. In speaking of American railroads, he referred to their enterprising methods of advertisement. One line, he said, lays its claim to popular favour on its freedom from dust owing to the use of anthracite coal, and hundreds of train cars have

pictures of a daintily-dressed lady stepping into a railroad car, with a verse something like this below:—

This is a maiden all dressed in lawn,
Who boarded the train one sunny morn;
At eve, to her surprised delight,
She had her dress all fresh and bright—
She'd gone on the road of Anthracite.

Sheep used as beasts of burden in North India carry 20lb. weight apiece.

In 1840 beetroots supplied 4.35 per cent. of the world's sugar. Now nearly 68lb. in every 100lb. of sugar comes from beet.



Photo by Editor.

CAROB TREE
At Farm of Mr. Fritz Reiche, J.P.
(See Article.)

Tree Planting in the Midlands of Natal.

By T. R. SIM, F.L.S., Conservator of Forests.

(Paper read before the Nottingham Road Farmers' Association, October 10th, 1903.)

IN tree-planting, as in many other industries, Nature affords object-lessons which should not be ignored. Where timber-trees grow naturally, these and other kinds of timber-trees may be expected to succeed if introduced artificially, while in treeless country some reason must exist which will probably militate against artificial afforestation as it evidently has against natural growth. Throughout the Midlands of Natal trees exist in forest patches wherever there are steep slopes facing eastward or south-eastward, and there are abundant evidences that at some earlier period these patches had been more connected than they are meantime. Looking broadly at the map of South Africa it will be seen that a belt of forest country extends in a more or less continuous line of forest patches along the whole of the east coast, but at varying, and sometimes considerable, distances from it. Beginning in the remnant of former forests at Swellendam, this belt traverses the Knysna and Zitzikamma forests, the excessively dry Addow Bush, the Katberg and Amatola Forests, and the Transkeian Zuurberg; then enters Natal at the Ingeli and also in Polela District, passing through Bulwer, Boston, Fort Nottingham, and Karkloof, and extending from these places eastward as far as Ixopo, Richmond, Pietermaritzburg and Noodsberg; then through Zululand by way of Qudeni, Tatabuleni, Nkandhla, Entumeni, Eshowe, Ngoya, and Pongola, while a more inland branch of the same belt passes Melmoth and Ingwavuma into Swaziland.

In all these places steep eastern slopes arrest and precipitate the rain passing in clouds inland from the coast, and produce a sufficiently moist atmosphere to meet the requirements of such timber-trees as enjoy the prevailing temperature. Beyond the higher ridges of this forest

belt, the country, the atmosphere, and the clouds are all more dry, and rain is less frequent and more violent, and forests almost absent until the Berg is reached, where conditions more like those of the forest belt are again met, but not quite so favourable; consequently Berg forests are more confined to ravines, and even in these they are composed of more stunted trees of smaller diameter, and of less economic value, besides often being twisted and gnarled. In the other direction forests closer to the sea than the recognised forest belt are usually composed in great measure of sub-tropical species of low economic value, of small size, and of bad form, intermixed with only a few really valuable trees; and even in artificial afforestation coast influences do not have the same beneficial effect as midland mists and rains. Following Nature, therefore, we have every reason to expect that the forest-belt, as above described, will be the most satisfactory site for timber culture, as it has proved the most suitable home for the natural forests of economic importance. And in this, experience bears us out. Although there are many tropical trees which succeed only on the coast belt, and a few mountain species which prefer high altitudes, low temperatures, and occasional snows, still the vast majority of trees suitable for culture in Natal either for timber production or for ornament are thoroughly at home in the forest belt, while more or less out of it elsewhere. But even within the forest belt there are variations of climatic conditions which materially affect tree culture. As already indicated, the steep south-eastern slopes are advantageously placed for intercepting rain-clouds, and either precipitating rain or forming mist; and it is in consequence of this that these slopes are generally known as mist belts; while they are also safe from direct insolation and from

hot north winds, and in consequence of the usual dense ever-green forest cover they remain moist and cool, and comparatively free from damage by grass fires or forest conflagrations.

Such slopes, unless composed of solid rock, if not meantime forest clad, have mostly been so before man, with his axe and cattle trespass, removed the canopy, and rendered a forest holocaust possible; in any case such slopes are the most suitable sites for tree-planting, even although on account of steepness and rank grass they cost more to afforest than more open and level sites do. Of the kinds mentioned by me at Dundee as suitable for the Upper Districts (see *Agricultural Journal* October 2nd, 1903), almost all are even more suitable for these Midland slopes, while the more tender kinds then mentioned, as well as many other tender or less familiar kinds, and a considerable number of broad-leaved European and North American species, can all be relied upon to give satisfactory growth. For decorative and shelter purposes, therefore, as well as for broad landscape effect, these slopes enjoy the most favoured position, and produce the greatest variety of shades and forms; while for timber production, they are clear of the adverse influences present to some extent almost everywhere else in South Africa, and they are, consequently, the centre of hope if Natal is ever to grow its own timber supply, or that required in the Transvaal. The indigenous forests seldom occur except upon these slopes, or in deep ravines where similar conditions prevail, but the indigenous forests are mostly composed of last survivors of that forest flora which must have been more vigorous and wide-spread centuries ago, when general conditions were moister than they are to-day; and these last survivors have a constantly increasing tendency to shrink more and more into the most suitable recesses as the general desiccation, which is surely if slowly increasing all over South Africa, becomes more and more pronounced. But among the exotics now being used, there are many which come from places where the climatic conditions are already more severe than those met with here in the

mist belts. And consequently they assume an aggressive attitude, and would sooner or later take possession if grass fires could be excluded. It is upon such species as these that we must rely when making an endeavour to afforest slopes facing the sun, or more level land outside the moist belts, whatever the aspect. The area of a mist belt is usually confined to the steep slopes, while the adjacent area over the ridge and facing northward more or less, and sloping down gradually to the next river-bed, is usually outside its influence, and considerably different alike in climate, soil, vegetation and insolation. In such a position as the latter it is not advisable to commence tree-culture on a commercial scale except the soil is deep and open, although for ornament and shelter many species will give good effect, while a few kinds actually improve the condition of the soil. Where there is plenty of depth, the number of kinds that can be grown is nearly as large as that suitable for the eastern slopes, those which have dropped out being mostly broad-leaved deciduous trees which cannot stand bright sunshine or an arid atmosphere, including such kinds as the Plane, the Sycamore, the Elm and the Ash. Eucalypts and Acacias do well, though both these genera transpire very freely, and consequently demand more moisture than their open canopy precipitates except in the moistest nooks, but this excessive demand, which at first is easily met, gradually tells on the neighbourhood, and eventually dries it out, leaving the trees bark-bound, stag-headed, and often prematurely mature. With pines and other slow-growing humus-producing kinds there is, on the contrary, a tendency to precipitate rain and augment the moisture-retaining power of the soil, though with *Pinus insignis* the growth is rapid and the moisture demand excessive, and often too much for a dry winter, even though the formation of humus is also very large. It will be seen from this that the statement so much used by advocates of extensive tree-planting, that forests produce and store rain, cannot always be taken as an invariable axiom. In Europe, where scientific forestry is mostly practised,

the kinds used, and climatic conditions experienced, render this statement usually correct; in most other parts of the world forests in existence are in greater part natural, and through natural selection of sites and kinds, productive of the same result; but here the demand for early returns, from sites not in accordance with nature, produces the contrary effect. Excessive transpiration is encouraged from positions in which the natural supply of moisture is small and intermittent. The amount of humus produced by Gums and Wattles (*Eucalypts* and *Acacias*), is small and too dry to be effective, and there is consequently a tendency produced rather to dry out than to augment the stores of moisture. This tendency has been successfully utilised in many places and in most malarial countries, by the introduction of Blue Gum (*Eucalyptus globulus*), in order to drain out, by excessive transpiration, what were formerly malarial swamps. The same tendency forms part of the nature of most of the species of *Eucalyptus* and *Acacia* which are so largely used in the afforestation work in this Colony, and consequently in sites facing the sun and exposed to insolation, hot winds, and dry atmosphere, the growth of these trees is often found to be more rapid than elsewhere, while it lasts, but more liable to be seriously affected by an unusually dry season, or a few of these in succession. The moral is, for such kinds, give preference to eastern slopes if available, and if these are not available, then select deep soil or open subsoil if these can be had, or alluvial bottom-land into which the neighbourhood drains itself. But for ornamental and shelter purposes there is no reason why the selection should be confined to Gums and Wattles. These have had preference mostly through being easily raised, and of rapid growth. The Wattles have had further preference through, in most midland districts, yielding an early and sure return in bark as well as timber, and also giving shelter-belts more rapidly and at less cost than any other kind, but on unsuitable ground and aspect they are often unsuccessful where other kinds

would do well. Perhaps the most satisfactory tree for shallow soil is *Juniperus Virginiana*, the Pencil Cedar, which, though it does not grow rapidly, seldom dies, and under any reasonable conditions does well. This tree is reproducing itself freely on Mr. Topham's estate at Umsindusi, on dry shallow shale; and, though seldom a large tree, it can be relied on where hardly any other kind will live. *Pinus halepensis* is another species of almost equal endurance, but has the further advantage of growing into a large useful timber tree if it happens to get a suitable site.

Cupressus pendula-glauca is another most useful tree for ornamental or shelter belts, even on rather shallow soil, though it does best and produces fine timber trunks on deep alluvial soil. It is always a graceful spreading tree, well supplied with branches to the base, and if it has a fault it is that these branches interfere with its timber value, so that special precautions have to be taken against them if the timber is to be utilised.

Cedrus deodara is also a native of rather dry ridges, and does very well with light rainfall, though, like most other trees, it makes more rapid growth on slopes containing constant moisture.

In Europe the different Pines are regarded as the best producers of humus, and consequently the greatest soil-improvers of all forest trees, and though in different species, the same holds good here. The species which produces humus in largest quantity in its earlier years is *P. insignis* already referred to. But after ten or more years' growth *P. pinaster* (Cluster Pine) is frequently as productive of humus, and being planted at less cost, and also more enduring as a tree, it is preferred for the production of timber, and is used more in Cape Colony than all other trees put together. The effect of trees towards soil-improvement is produced through the actual addition on the surface of layers of fallen leaves or needles, which, on decomposition, form humus, and add depth to a shallow soil, vegetable mould to a sandy soil, and openness to a clay soil. This effect is much more rapid than is usually believed, and it is most easily seen where a planta-

tion is formed on drifting sand, in which case not only is the sand fixed, but a layer of black soil of considerable depth is deposited above the sand within a few years. But the more important effect of humus lies in its relation to the storage of moisture. Heavy rain falling either on dry soil or on saturated soil, especially if on a steep slope, runs off very rapidly, and little is left to soak in. But where there is a coating of humus, which is naturally of an open porous nature, and capable of absorbing a vast amount of water, none runs off; all is retained in the humus long enough to allow it to soak into the soil or subsoil below, and in this way the underground supplies which feed the springs are charged. This water supply, however large or small, oozes slowly and gradually, but regularly, into the springs, which then become constant and of unvarying quantity, instead of a heavy flow after rain and none during drought, as so often happens where there is no humus. A mistake is often made, however, in planting trees around the eye of a spring and along the course of a stream under the impression that these trees will produce this effect. The fact is, springs are seldom fed from their immediate neighbourhood, the flow usually coming from some catchment area at a considerable distance, and usually higher up the same valley. In such case it is not around the eye of the spring, but throughout its catchment area, if such can be discovered, that tree-planting should be done to be effective. And even there the kinds used must be humus-producing kinds, such as pines or broad-leaved deciduous trees, for Wattles and Eucalypts introduced into such a position produce little humus, and consequently form dry forests, while their own powers of transpiration are sufficient to drink up whatever rain sinks into the ground. It is on purpose to afforest the unknown catchment areas of valley springs that tree-planting is usually carried far up the mountain slopes, where even systematic and scientific forestry is being carried on. Planting round the eye seldom affects this materially, but it does have an effect in preventing evaporation from the stream as it flows, and this

effect continues so far as the stream is flowing in the shade of trees. In India, where the evaporation is very great, it is a crime to cut trees along the course of a stream, or at its head, and I have heard many statements and complaints concerning the drying up of streams in the Natal coast belt since the clearance of bush from streams and springs and from their catchment areas has taken place on purpose to make way for badly kept coolie fruit gardens.

Kinds of trees suitable for timber production have been mentioned in a previous paper, but the use of trees for ornament requires separate treatment. All the useful kinds for timber production may be utilized also for landscape effect, but not *vice versa*, as many ornamental kinds have no economic value. It is seldom worth while trying to combine timber production with scenic effect, except in as far as ornamental trees may eventually be used for firewood or for general farm purposes. The Black Wattle (*Acacia mollissima*), is, perhaps, the best known exception to this, for even in its scattered condition as a break-wind or shelter belt it is always ornamental, and lends a charm to the districts in which it is successful, while its bark is not inferior to that produced in the more stiff and formal plantations where dividends are the first object. Indeed, as scattered trees, it assumes a dwarfer and more branching form, and a much more ornamental character than it ever does in the close plantation. The same remark applies more or less to trees of every species, for in ornamental work the first desideratum is a tree clothed to the base with branches, while in timber production branches are carefully prevented, since they produce knots, and consequently reduce the value of the timber. It is because British plantations are all intended either for ornament or for game protection, and treated so as to produce branches instead of clean stems, that British-grown timber is now refused in Britain for all technical purposes, and foreign timber has to take its place. And in Natal there is a tendency to plant trees for ornament and expect them to prove of economic value, though the two things

are naturally antagonistic. Timber production is a stern necessity which sooner or later will force itself upon every South African Colony, but meantime, planting for effect is the more common of the two, and will remain so while trees are planted by the hundred instead of by the millions.

The most noticeable feature in the tree planting of Natal is its rigid and homogeneous character. It consists of either Wattles (Acacias) or Gums (Eucalypts). Wattles in long straight belts with parallel sides and regular angles, and all of one colour, size and form, are more formal and severe than picturesque, though even these are much better than no trees at all, and they have the advantage of bringing in a return both in bark and firewood. Eucalypts of one or even of several kinds, all in straight line and all branchless below and pointed upward above convey a sense of monotonous rigidity which could hardly be associated with a pleasant landscape effect. Almost everywhere the vastness of the scene as a whole, and its absence of variety, render effective landscape planting a difficult matter; but even these difficulties can be got over in part by planting all the higher ridges, giving an irregular outline, using many kinds artistically mixed, and within the planted boundary having clumps or single trees of diverse habit and colour scattered about. The tall pyramidal form of a young Blue Gum or of a Lombardy Poplar is not harsh and formal when appropriately set off by other dwarfer and more spreading kinds, and even an Araucaria has its formal beauty enhanced by an informal and varied setting. Irregular planting, that is, not only mixing kinds but planting the trees at irregular distances apart, tends to remove stiffness, and if each tree has sufficient room to produce all its branches and keep them till it is mature, a natural and park-like effect is produced which no close planting can show. If, in addition to this, trees of widely varying hues of colour can be introduced, the effect will be much improved. Thus Silver Wattle (*Acacia dealbata*), *Cedrus deodara*, and *Cupressus pendula glauca* can all be used

for various glaucous-greens, as also can *Eucalyptus stuartiana* and Blue Gum (*E. globulus*), while young Blackwood (*Acacia melanoxylon*), Black Wattle (*A. mollissima*), Yellow-wood (*Podocarpus*), and a long list of Eucalypts and Pines produce among them many shades of dark green and many different leaf-forms and habits of drooping. Plane (*Platanus*), Poplar (*Populus*), Catalpa, Ash (*Fraxinus*), Oak (*Quercus*), Lirodendron, Ficus, Magnolia, White Mulberry (*Morus*), Robinia, Gleditschia, Bauhinia, etc., introduce many new leaf-forms and colour-shades; while the Crimson Oak (*P. coccinea*), the Purple Plum (*P. pissardii*), and the autumn tints of several species of Acer introduce deep red foliage colours, and several variegated sports give white and yellow. The Weeping Willow (*Salix Babylonica*) is unique in its pendent habit; the Lombardy Poplar (*P. fastigiata*), and the Upright Cypress (*Cup. pyramidalis*), are almost alone in their peculiar upright symmetry; while the larger Bamboos have an erect, yet spreading beauty of their own, productive of striking scenery effect. Each of these forms, colours, leaf peculiarities, and general habits requires to be represented, but none of them overdone if a first-rate general effect is to be produced, and flowering trees, such as the white, the yellow, and the scarlet Eucalypts, the scarlet *Brachychiton*, the pink *Bauhinia*, the white *Magnolia* and many others also require a place, together with the even more profuse and brighter flowering creepers and shrubs in variety. A mixed and harmoniously blended whole is thus produced by the most dissimilar units; a whole more closely resembling a natural forest than a pure plantation of any one kind of rigid and stately Australian tree ever does produce. But though all this is effective in landscape work it must not be confused with good timber forestry. In Europe it is the practice in forestry to use several species, of different natures, mixed together; and in the natural forests of Natal many slow-growing species are naturally mixed together, which, through the survival of the fittest through many generations, have gradually killed out such kinds as could

not accommodate themselves to being crowded or dominated; but in afforestation work throughout South Africa mixtures of fast growing trees have usually proved failures, and the most successful timber plantations are those in which one kind only is used. Each kind has a different

requirement of light, moisture, or canopy, and though the mixtures may be theoretically correct, and at some future date actually practicable and advantageous, the present position of forestry justifies only pure, or almost pure, plantation forests, whatever the species may be.

African Coast Fever.

DR. KOCH'S THIRD REPORT.

In continuing the record of the African Coast Fever investigation, it will be remembered that in my Second Report I explained that while a single injection of a susceptible animal, with blood drawn from an animal in the acute stage of the disease, did not reproduce the disorder in its characteristic form, repeated injections with such blood appeared to induce a mild attack characterised by an elevation of temperature, and the appearance of a certain number of parasites in the circulating blood. From this I surmised that there was a possibility of a certain degree of immunity being established by such successive inoculations, the extent whereof could only be gauged by submitting such inoculated animals to some method of infection severe enough to induce, in unprotected animals, an attack of African Coast Fever of an intensity similar to that ordinarily communicated by natural veldt infection.

The discovery of such means of infection was greatly to be desired, in order that we might be able to test the serum which we had prepared, and to decide certain other questions of importance. Various experiments were made to achieve this end.

The mild infection induced by repeated injections of blood taken from sick animals was passed through a series of healthy cattle, in order to determine whether the virulence of such attacks might not be heightened by such a transfer; but passage from one animal to another through five animals in no wise

intensified the severity of the attack, the last animal reacting no more severely than the first. This experiment, however, proves that under certain conditions the organisms of Coast Fever may multiply and reproduce themselves in the blood of artificially infected animals, even when they give rise to no visible indications of disease. Our experiments have also shown that inoculations with the blood of recovered animals, which only contains an inconsiderable number of single parasites, will induce similar modified attacks of African Coast Fever, and, while these experiments have not been numerous, they tend to indicate that recovered animals are even more suitable for inoculation purposes than those which are actually sick.

In other directions we sought for a means of communicating the disease in its virulent form. For instance, intra-ocular injections with infected blood were tried without effect, and we also endeavoured by means of tick infection experiments to imitate natural methods. For this purpose cultures of the various varieties of suspected ticks were prepared. At first much difficulty was experienced in hatching out such cultures on account of the coolness and dryness of the atmosphere, conditions which experience has shown are unfavourable for work of this description. Ultimately, however, by the use of an incubator, in whose interior the humidity of the air was artificially increased, the eggs laid by ticks collected from our animals were hatched out as expeditiously as they are

under the most favourable natural conditions, but when the young ticks so hatched were placed upon healthy animals, we found that, with the exception of certain doubtful cases, we failed to produce a characteristic attack. Trials were made with broods of various varieties of ticks—with broods hatched out at different temperatures, and with broods kept for various periods before being placed upon the animals—and this work is still being continued. To approach natural methods still more closely, broods of young ticks were liberated in various localities on the grass, and susceptible animals were subsequently grazed in such places. That this method should be successful appeared somewhat doubtful, as we expected that the drought, high winds, dust and sun would speedily destroy the liberated ticks, but, in spite of the unfavourable weather, these larval broods remained where they were placed, being most abundant on the sheltered side of the grass stems away from the sun, and particularly plentiful at the extremity of the stalks, where they clustered together in small clumps apparently waiting for the passage of a suitable host to whom they might attach themselves. These larval ticks displayed no tendency to migrate or travel from place to place, but remained where they were placed for several months. High winds seemed to scatter them a little in the direction in which the wind was blowing, but no other atmospheric change appeared to affect them. Soon after sowing these broods of seed ticks in the veldt we found that it became highly infective. Previously only occasional cases of African Coast Fever had occurred amongst animals grazing in these places, the natural veldt infection appearing to be so slight that animals might graze there for many weeks without sickening, while latterly, ticks had become exceedingly scarce and cases of sickness had been correspondingly few in number, apparently on account of the cold and drought.

The change in the infective property of the veldt was presaged by a gross tick infection of all our animals, many nymphs and, subsequently, many full-

grown ticks were found upon them, and every susceptible animal which we exposed speedily became sick. Since then on several occasions animals have been turned into this veldt to test their immunity, together with a number of susceptible cattle to act as controls, and in each instance the controls became infected and died in about a month. From this circumstance we can safely assume that any animal remaining healthy upon such a veldt must be immune.

In this way we have attained the end for which we sought, and now have at our disposal a certain means of testing the immunity of any animal by a process which is preferable for our purpose to any other, because, after all, it is veldt infection which animals must be brought to withstand, and any artificial method of infection would ultimately have to be compared with the test by veldt infection in order to prove its reliability.

Now, being in a position to test our animals from the first by natural infection, our experiments should satisfy all legitimate requirements.

I will now proceed to show what has been the result of testing our various experimental animals upon such an infected veldt.

These experimental animals may be divided into three groups, of which we will take first, those animals treated with injections of blood.

A certain number of animals were subjected to a single inoculation with a small dose of blood taken from a sick or a recovered animal. These animals appeared to possess no immunity, as they all sickened and died; nor were animals injected with a single large dose of blood drawn from a sick animal in any better case, as 500 c.c. of blood so given afforded no protection. Repeated injections were more satisfactory, and appeared to confer an undoubted immunity. Successive injections with blood taken from sick animals in doses of from 200 to 2,000 c.c., with an interval of from ten to twenty days between the injections, produce a high degree of immunity, which may be attributed to the fact that the blood of animals so fortified acquires

properties which render it unsuitable for the multiplication of the specific micro-organism of the disease. It is to be regretted that such a method of inoculation cannot be profitably employed on a large scale for protective purposes, on account of the difficulty experienced in obtaining blood in the quantity necessary for such a method of immunisation.

The effect of inoculation with smaller doses of such blood is not so satisfactory, but I believe that repeated small doses of blood will confer an immunity which will be heightened in direct proportion to the number of injections to which the animal is subjected, and our experiments show that it is not necessary to employ the blood of sick animals for this purpose, as blood taken from recovered animals has a similarly satisfactory effect, and in some cases, even a better one.

While the number of animals which we have treated in this way is at present small, and I cannot give figures to show what per centage of animals have been protected, all the work done promises so well and points so clearly to the establishment of an undoubted immunity, that I think the time has arrived when this method may be put to actual test in the field.

Of our experiments in this direction I may instance two characteristic examples.

The eight animals previously mentioned subjected to repeated blood injections, in the course of which the specific organisms of the disease were conveyed from one to another in the expectation that the disease would gain virulence in its passage, were afterwards sent into the infected veldt. One of these sickened and died after the usual interval, many parasites being present in the circulation; this animal appears to have had no immunity whatever. Numbers two, three and four sickened and died after a considerable interval, and in their case the disease underwent a marked modification, being characterised by an unusually small number of parasites in the circulating blood. For three months after it was turned into the infected veldt number five continued per-

fectly healthy; it then became sick, and now only numbers six, seven and eight survive. These are quite well to-day, and appear to be immune.

A remnant of three out of eight is small, but allowance must be made for the fact that these animals only receive two injections of the mildest virus at our command, therefore I consider that this result may be taken as showing the minimum ratio likely to be protected by repeated blood inoculations. In the case of number five, and also, perhaps, in the case of two, three and four, permanent protection would probably have resulted had the blood injections, by which they were temporarily immunised, been repeated.

A somewhat similar experiment was made with the blood of a cow which came from Beira, shortly after the establishment of the Hillside Station, and which can be considered immune, as it has been running on infected veldt ever since its arrival. In its blood we find the occasional Coast Fever parasites usually present in such cases. Two susceptible animals were injected subcutaneously with 20 c.c. of this cow's blood on six successive occasions, with an interval of three days between each inoculation, and were afterwards turned out on the infected veldt. After some months one animal sickened and died. In this experiment I consider that the interval allowed between the injections was too short, and with more lengthy intervals results would have been better.

At present it is impossible to say definitely how long immunity of this description will last, how many injections should be made, or what space of time between the inoculations is best; nor can I state what class of recovered animals are most suitable for inoculating from.

For the solution of these and other questions experiments are still being made, but at present I am of opinion that the best results will be obtained by using freshly-drawn defibrinated blood from recovered animals which are in good condition. This blood should be injected subcutaneously into each animal which it is desired to protect in a dose of ten

cubic centimetres, and the injection should be repeated four times with an interval of seven days between each injection. Afterwards 10 c.c. doses should be given for some time every two weeks, and later a dose once a month should suffice.

Continuing the record of our investigations, I now come to the second experimental group. In this are comprised animals treated with serum.

The serum used was prepared, as I explained in my former report, some of our immune animals being injected with increasing doses of blood taken from sick animals, beginning with doses of 5 c.c., and finishing with a maximum of 2,000 c.c., while others received a succession of doses of 2,000 c.c. each of sick blood injected subcutaneously, or of 1,000 c.c. injected intravenously. As successive large injections gave the best results, the system of gradually increased dosage was abandoned. In fortifying these animals, special care was taken to select samples of blood containing a large number of organisms, no blood being employed which showed on microscopic examination less than an equal number of parasites and blood cells. This precaution was necessary, as it was our intention to prepare a serum which would exert its influence specially upon the disease-producing organisms present in the blood.

After three or four large injections given at intervals of from two to three weeks, which were well borne by all the inoculated animals, the serum of these animals was found to possess very remarkable properties. When injected into healthy animals in doses up to 150 c.c. no systematic disturbance resulted, but when sick animals were similarly treated, its administration was followed by a striking change in the African Coast Fever parasites circulating in their blood. The parasites became smaller, their outline was lost, sometimes they were scarcely visible, and in the course of a few days they disappeared. Carefully-kept records show that in every case in which serum was administered, even to animals which were highly infected, there was always a marked reduction in

the number of parasites, and sometimes they vanished altogether. Details of these records which possess a high scientific interest I hold over for a later and more exhaustive report. This specific action of our serum upon the organisms of the disease was exactly what we sought, but we found that, unfortunately, it also possessed, in a very high degree, an undesirable haemolytic property which exerted a solvent action upon the blood cells of sick animals. A slight haemolytic action was looked for as the inevitable result of the association of red blood cells with the organisms in the blood used for fortification, from which it was impossible to separate them, but the exceptional character of the haemolysis produced in sick animals inoculated with this serum, while healthy animals remain unaffected, would indicate that in this disease the red blood corpuscles are in an unusually unstable condition.

Injection of 50 c.c. of well prepared serum into a sick animal has nearly always been fatal, death being primarily due to its solvent action upon the red blood cells. In sick animals so treated there is a sudden rise of temperature, followed by an equally sudden fall, which is associated with collapse and death. On post-mortem the urine is found to be bloody, and the fat, subcutaneous tissues and mucous membranes are intensely yellow from staining with altered blood pigment. These appearances follow the administration of serum not only in cases in which the disease has become well established and many parasites are present in the blood, but even when it is given before any parasites appear in the circulation, and while the only indication of approaching indisposition is an elevation of temperature. To discuss the scientific bearing of these phenomena would occupy too much space and would be somewhat beyond the scope of this report. I will, therefore, defer such discussion until the final report is prepared.

The employment of serum for therapeutic purposes having been found to be highly dangerous if large doses were given, the administration of repeated

small doses was tried. By this means in some cases we succeeded in banishing the parasites without producing either haemolysis or yellowness of the mucous membranes, nevertheless the animals died. Post-mortem examination in these cases showed that the pathological changes which had taken place in the kidneys, liver, and lymphatic glands were of such a character that recovery was out of the question. Only when animals were treated with small doses of serum in the initial stages of the disease were we occasionally able to save a few, but in practice such a method would be inapplicable, as treatment could only be begun in time if systematic temperature records were kept of every animal, and microscopic examination of their blood made from time to time.

Preventive treatment was also attempted by means of serum inoculation. In some cases a single large dose was injected while the animals were healthy, and in others repeated small doses were given, the animals subsequently being turned into the infected veldt in the hope that natural infection would produce, in any animal protected by serum injection, an attack of such moderate intensity that recovery and subsequent immunity would follow. Three animals treated with large single doses of serum and afterwards turned out, all sickened and died, although the prolonged duration of their illness showed that in their case the serum exercised a certain inhibitive action. In other animals subjected to repeated doses no beneficial result followed the administration of doses of 5 c.c., but repeated injections of 10 and 20 c.c. had marked but varied results, much, apparently, depending upon the particular sample of serum employed. In one experiment, for instance, with serum taken from one particular animal out of eleven animals inoculated, six ultimately became immune, while with another sample of serum we were only able to save one animal in ten, and 50 c.c. of another sample of moderately powerful serum saved and immunised three animals out of six.

It is possible that by preparing a more powerful serum, which would have

taken a longer time, and by other modifications of the process, better results might have been obtained, but in the course of our work we found we had to reckon with a complicating factor which interfered most materially with any satisfactory application of serum treatment; this factor is the occurrence of Texas Fever complications. Texas Fever or Redwater infection, I have found in the course of our experimental work here, is much more widely disseminated in Rhodesia than I at first suspected, in fact, to such an extent does it exist that we need not be at all surprised if any Rhodesian animal develops an acute attack of Texas Fever or Redwater when attacked by any febrile disorder of a debilitating nature.

In former reports I have referred to cases in which Coast Fever has been complicated by Redwater, induced as a result of the lowered vitality and elevated temperature caused by the first-mentioned disease. The same complications were encountered in the course of our serum experiments. In several cases in which animals attacked by Coast Fever appeared to be approaching convalescence after serum treatment, their temperatures having subsided and the parasites of Coast Fever having almost entirely disappeared, a sudden rise of temperature occurred which heralded the appearance of the organisms of Redwater in the blood, the urine became bloody, and the animal, already weakened by the attack of Coast Fever, collapsed and died.

In this manner we lost no fewer than fourteen animals which presented every appearance of rallying from attacks of Coast Fever, mitigated as these were by the administration of serum, and there is no doubt that, in the absence of Texas Fever infection, serum treatment would have been much more satisfactory.

In our second serum experiment, in the course of which only one animal survived out of ten, death in several instances was due to Texas Fever complications.

This experience shows that any system of preventive inoculation against Coast Fever is likely to be attended by a high mortality if it is based upon the produc-

tion of a severe attack of the disease which is to be artificially controlled by serum treatment, or in any other way, as such severe attacks are likely to be followed only too frequently by fatal attacks of Redwater. The best way to avoid this grave danger is to have recourse to some method of inoculation which will only produce such modified attacks of the disease as are not likely to have an unduly lowering effect upon the constitution of the animals subjected to it, and mild attacks of this description are produced by repeated blood inoculations. In no instance where blood inoculation was tried did we lose an animal by reason of the appearance of Texas Fever, and, therefore, I am convinced that this method is at present the only practical one which can be profitably employed for the protection of susceptible animals.

Our third group of experiments were made upon animals believed to have become immune under natural conditions.

(Of these experiments I may instance the following :—

- (a) Two half-bred Zebu cattle were presented to the Station by Dr. Sauer, who thought that cattle of this class might be found to possess a natural immunity to Coast Fever. Both animals were turned out to graze upon our infected veldt, and shortly afterwards they became sick and died.
- (b) Five animals bought in Beira were brought to Bulawayo and run upon infected veldt. Of these, three sickened and died, two being young animals of pure Zebu breed. The survivors, old cows, have remained perfectly healthy, and have given birth to strong and vigorous calves, and the blood of one of these cows has been used for immunisation purposes with good results.
- (c) Six animals presented by the German Government were sent to Bulawayo from Dar-es-Salaam for test. None have contracted African Coast Fever, but

two have died from other causes, one being infected with Tsetse.

- (d) A number of animals (some, the survivors of various Salisbury herds ; some, animals which had been subjected to inoculation at Hillside Camp with blood taken from Texan cattle previous to my arrival, all of whom had been grazing for many months upon infected veldt in Salisbury and Bulawayo) were turned out on our artificially infected pasture. None of these have sickened.

From these observations we may conclude :—

- 1st. Zebu cattle have no inherent immunity.
- 2nd. German East Africa cattle from coast districts are perfectly immune, and also some Beira animals, a fact bearing out my surmise that this disease is of coastal origin.
- 3rd The resistance displayed by naturally immunised animals indicates that such animals may be depended upon to withstand infection. Up to the present time we have not met with a single case of relapse in recovered animals, and we may, therefore, assume that recurrence of the disease only occurs in rare instances.

I have now studied this disease in all directions, so far as this was possible, for six months, and have made numerous and exhaustive experiments, therefore I believe I am sufficiently well informed to be in a position to express an opinion as to what means are best adapted for combating it.

In this relation naturally the question of the feasibility of stamping out the disease presents itself. That this might be possible under certain conditions I believe, as with the assistance of the microscope we are able to identify all animals capable of spreading infection, not only animals which are sick, but also animals which have recovered from the disease and are still able to infect indirectly. Animals of the latter class, which may retain the specific

organism of the disease in their circulation, perhaps for the remainder of their lives, may be regarded as the real carriers of infection. How these animals may be disposed of demands consideration if the eradication of the disease is contemplated. With such an end in view it would be necessary to place recovered animals in such a position that they would no longer be a danger to others. This would not be so costly a process as it would be in dealing with some other diseases as there would be no necessity to destroy such animals summarily. It would suffice if they were separated from their susceptible neighbours, and subsequently used for slaughter purposes. The position, therefore, somewhat resembles the position with regard to glanders, in which disease certain infected animals are identified by means of the Mallein test, and are subsequently destroyed. Combating the spread of Coast Fever is in some respects less difficult than combating the spread of glanders, as the necessary measures would be simple, more certain, and less expensive.

But there is one condition which must be fulfilled if such a measure is to succeed, and that condition entails absolute control of all cattle and of all movements of stock.

Under European conditions where this is feasible, stamping out a disease of this class would be the best way of dealing with it, although such a process would be expensive and would take some years to carry out. Here, however, in Rhodesia, conditions differ altogether from those obtaining in European countries, as native cattle cannot be placed under control. Chief Veterinary Surgeon Gray, who is well acquainted with local conditions, assures me that such a stamping out process would be altogether impracticable in the present unfenced condition of the country, and impossible of application to native cattle, therefore another way out of our present difficulties must be sought, and the only one available is through artificial immunisation. Immunisation of cattle against African Coast Fever, it should be remembered, differs in one very im-

portant respect from immunisation against Rinderpest and Lungsickness. Animals inoculated against Lungsickness and Rinderpest do not become a future source of danger to susceptible cattle in their vicinity, but in all malarial diseases of the class to which African Coast Fever, Texas Fever and Tsetse disease belong, immunised animals, although not directly capable of communicating infection, are indirectly able to do it with the assistance of an intermediate insect bearer, which, in the case of African Coast Fever, is the tick. Such immunised animals, while they remain in apparent health, are still able to disseminate infection, and that this is the case seriously handicaps those interested in stock raising, for it means that their surplus animals are not available for export alive, nor can pedigree animals be introduced from without unless they are subjected to an immunising process, and the most practicable process of immunisation against African Coast Fever, which I can recommend at present, is that of inoculation with recovered blood.

Were it not for the fact that the country is threatened by an epidemic invasion of African Coast Fever and that the rainy season is approaching, when a recrudescence of the disease may be expected, I would have preferred to devote more time to the investigation of the merits and demerits of this method before expressing an opinion about it, but under present conditions I consider that circumstances justify my bringing the matter forward without delay, although it has not yet been gone fully into.

Every method of immunisation requires time before its benefits are apparent, and the establishment of immunity in African Coast Fever will take, I think, from four to six weeks. To wait, therefore, for the opening of the rainy season, when the spread of infection will be much more rapid, before commencing operations, would probably mean that many more animals would be lost, as the inoculation of infected animals will be without beneficial effect. The process recommended is devoid of risk and is inexpensive. For the pre-

sent I advise that it be only applied to animals exposed to imminent risk of infection, to infected herds and to animals running on infected pastures, particularly to herds in which isolated cases of the disease have only recently occurred. The work of carrying out such inoculations should, when possible, be left to veterinary surgeons or to those who have been instructed in the method. The animals used for taking the blood intended for inoculation purposes should be in apparent good health and condition, and should be either animals which have recovered from an unmistakable attack of the disease, or animals which have survived an outbreak which has carried off the majority of their neighbours, and which have subsequently grazed for a long time upon veldt known to be highly infected, and, when possible, the blood should be first microscopically examined before use, in order to determine whether the organisms usually found in the blood of recovered animals are present.

For the convenience of farmers and stockowners who are so situated that they cannot obtain the assistance of a veterinary surgeon and who are unable to get an object lesson in the process of inoculating, the following directions are appended:—

To INOCULATE.—The operator should provide himself with the following appliances:—

- A lancet or sharp pointed knife.
- A trocar with canula about one-eighth of an inch in diameter, or a canula of this size pointed in the same manner as a hypodermic needle, to draw off the blood which is to be used for inoculating.
- A wire egg whisk which has previously been cleaned by boiling or heating to redness in a fire.
- A hypodermic syringe to contain ten cubic centimetres which should have previously been boiled along with the needles, to be used for inoculating.
- Two enamel pitchers to hold about half a gallon each, which have been rinsed first with a five per cent. solution of carbolic acid in water,

and then washed out with boiled water.

A few pieces of freshly-boiled clean muslin to strain the blood.

To prepare it for the operation of bleeding, it should be cast, its legs secured and the head held down. The jugular vein is then raised by passing a strong cord round the base of the neck; the hair should then be clipped off over the vein and the skin washed with soap, using a five per cent. solution of Jeyes' Fluid or carbolic acid in water; then make a small incision over the vein along its length, with the knife cutting through the skin, insert the trocar and canula into the vein, passing the trocar upwards in the direction of the head, withdraw the trocar leaving the canula in the vein, and draw off the blood required into one of the enamel pitchers, stirring it all the time with the wire whisk to prevent it from coagulating.

When a sufficient quantity of blood has been taken, the cord should be loosened from the neck and the canula withdrawn. The wound may then be closed by placing a piece of adhesive plaster over it, by putting a stitch through the skin on either side with a suture needle and a suture silk, or by pinning the lips of the wound together with a pin, which should only pass through the skin, and then twisting a piece of silk around the pin figure-of-eight fashion.

After stirring the blood for ten or twelve minutes it should be strained through a piece of clean muslin into the other enamel pitcher, and carefully covered to keep out dust and flies; it will then be fit for use.

As a pint and three-quarters of strained blood is sufficient to inoculate one hundred head of cattle, it will seldom be necessary to draw more blood from an animal at one time than three pints, which, when whisked up and strained, will give at least 1,000 c.c. suitable for inoculating with, although, if necessary, three or four quarts can be taken from an animal without injury. Every care should be taken to cleanse the site of the

operation before bleeding, and the vein should be injured as little as possible when the trocar is inserted.

In cases of urgency, where a trocar and canula cannot be procured, the jugular vein may be raised in the ordinary way and the animal bled with a fleam, but by so doing there is more risk of damaging the vein than if a canula is used, and the blood is more likely to be contaminated.

To inoculate animals which it is desired to protect, the animal is secured, the syringe is filled with strained blood, the loose skin of the neck is gathered up between the thumb and forefinger, the needle of the hypodermic syringe is inserted under the skin, 10 cubic centimetres are injected, the needle is with-

drawn, the swelling caused by the injected blood is rubbed gently away with the hand, and the animal is released. The dose for all animals is 10 cubic centimetres, irrespective of age.

In conclusion, I wish to impress upon those intending to inoculate, that at this stage of our work, when the whole question has not been gone thoroughly into, too much must not be expected of the method, nor must good results be looked for when it is applied to herds in which the disease has gained a thorough foothold.

R. KOCH.

Balawayo, Rhodesia,
25th September, 1903.

The Durban Veterinary Compound.

INSPECTION OF IMPORTED STOCK.

By ERGATES.

AS comparatively few farmers know anything of the Veterinary Compound at Durban, it occurred to me that a short description of that wicket through which pass practically all the imported live stock for the Colony would be of general interest to the readers of the *Journal*. Accordingly, with the sanction of the Principal Veterinary Surgeon, I went to the Compound and learnt all I could about it from the officer in charge, the District Veterinary Surgeon—Mr. S. T. Amos, M.R.C.V.S.

The Compound is not difficult to find. An electric car takes you to the Point, and on turning up the street by the Alexandra Hotel, which leads seawards, after three or four minutes' walk, chiefly through loose sand, you reach it. The Compound is a corrugated iron enclosure of about three acres, and you gain entrance through a door in charge of a native. The chief features one notices on entering are two large airy sheds,

which, at the time of my visit, were chiefly occupied by a shipment of New Zealand heifers and young cows. The animals were an attractive lot—mostly Ayrshires, with a dash of Shorthorn. One had just calved, and several had calved in the ship and in the Compound during the last fortnight. All were quiet, and contentedly eating forage. While looking at them it was difficult to refrain from thinking of their chances of life when, in course of time, they become introduced to the redwater tick infested veld. These animals, including a beautiful Shorthorn bull, a Hereford bull, and some other odds and ends, besides being under observation, were waiting for tuberculin inoculation. When cattle leave a ship their temperatures rise immediately, and until their temperatures become normal—about a couple of days—the test is, of course, impossible.

This testing for tuberculosis is sometimes a big affair. A short time back when there were constant importations

of Madagascar oxen, the average number of monthly testings amounted to over 1,400. The French authorities in Madagascar are about to test animals previous to shipment, and certificates of freedom from tuberculosis will be sent with the shipments. The professional status of the veterinary surgeons who are to be employed for the testing will be high, and the certificates will probably be thoroughly reliable; of course, the certificates will not in any way interfere with the right to test by our Colonial Veterinary Department.

Of late there has been much work in connection with foot and mouth disease. That is the disease with which the Argentine Republic is associated, and as all know the importations of stock and fodder from that country have been immense. All the ships arriving are stopped at the outer anchorage. If they have only fodder on board, which is officially certified to have come from non-infected districts, permission to enter the harbour and discharge is given. In May last no fewer than 3,000 sheep and 300 cattle were slaughtered at the outer anchorage, these animals—some infected—having been shipped before the Argentine people were aware of the Natal proclamation. While the slaughtering was going on, 57 horses and 88 mules were dipped. Foot and mouth disease, though rarely fatal in South Africa, is a most troublesome disorder, and is particularly contagious. The thorough disinfecting of the horses and mules was therefore imperative. In the first place they were thoroughly washed, especially their legs and feet, and then were slung from a derrick into a large dipping bath, and thence, without further contact with the ship, they were dropped into lighters.

Horses are chiefly inspected with a view to the detection of glanders and mange.

Owing to Surra disease, no importation of stock is permitted from Mauritius. In fact, with the exception of Europe, New Zealand, Canada and India under certain restrictions, Natal is closed to stock from all parts of the world. A few weeks ago 10,000 head of cattle for the Transvaal from U.S.A. passed by, within

sight, for Delagoa Bay, landing at Durban being prohibited.

The Compound is destitute of any signs of vegetation; all is sand into which one's feet sink, and which often blows into and out of the Compound by scores of tons. Besides the big sheds already referred to, the Compound contains a *post-mortem* room, offices for the veterinary surgeon and his assistant (Mr. J. A. Morrison), stables with loose boxes for about forty horses, crush pen, stocks, etc. Of course there is electric light for night work.

In reply to some questions about facilities for landing stock at the Port, Mr. Amos said:—

“Capetown will shortly have finished an up-to-date Abattoir to deal with the large numbers of imported slaughter cattle, which come chiefly from Argentine for the fresh meat trade, and there is no doubt in my mind that if we are to retain this trade here, the erection of a complete Abattoir is necessary. A suitable site would undoubtedly be on the ocean side of the present Compound. The killing charges, increased Customs dues, and the railage attendant to such an enterprise would materially swell the Government revenue, and, above all, would be an excellent safeguard to any possibility of slaughter stock introducing disease in the Colony which might be latent and escape detection under our present system of inspection.”

The facilities for the observation of stock at the Compound are great, as great as they are small on board a ship. Inspection on a ship is, as may be imagined, difficult, disagreeable and dirty. Climbing and crawling about, lantern in hand between decks, the heat intolerable, and the ammonia fumes from the manure blinding, do not conduce to efficient inspection, and the advantage of the Compound for observing doubtful cases can readily be understood.

What, perhaps, struck me most of all was the healthiness of the site of the Compound. As most know, the Point is a longish spit of land, and the end of it, where the Compound is situated, is nothing but the sterile sea sand. Here is no harbour for ticks, and hence absolute

freedom from redwater; here mosquitos are unknown, and hence freedom from horsesickness. Mr. Amos told that even when working at night by the electric light in the open sheds he had never noticed a mosquito. He further told me that a piece of meat if thrown on the sand, despite the humidity of the air, instead of putrifying, becomes dried up, and soon resembles biltong. These healthy conditions of the present compound are not, I think, commonly realised, for there is a feeling among some stock importers that detention in Durban

is dangerous in the last degree. Evil germs and insects have no chance for existence at this wind swept extremity of the Point sand spit. And this is not merely theory; it is supported by experience. A short time ago a consignment of susceptible Australian heifers lived in the Compound for six months, and not one of them developed any symptoms of redwater.

To Mr. Amos I must express my thanks for most of the information above recorded.

Veterinary Departmental Report for September, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of September, 1903:—

Scab.—Fifty-eight fresh outbreaks have occurred during the month.

Klip River County, 13; Weenen County, 15; Umvoti County, 2; Upper Umkomanzi Division, 1; Lion's River Division, 3; Polela Division, 6; Ixopo Division, 7; Alfred Division, 4; Utrecht Division, 1; Vryheid Division, 6.

Latungsickness.—Seven fresh outbreaks have occurred during the month.

Newcastle, 1; Umlazi, 1; Vryheid, 1; Paulpietersburg, 4.

Anthrax.—Nineteen deaths reported.

Glanders.—Eight clinical cases have been destroyed during the month, and 7 which reacted to mallein.

Quarter-evil.—63 deaths reported.

Vegetable Poisoning.—85 deaths reported, cattle.

Rinderpest.—This disease exists in the districts of Eshowe, Umlalazi, Mahlabantini and Nkandhla, Zululand, and in the Babanango District, Vryheid Division.

124 deaths occurred in Zululand and 76 in Vryheid District.

Rhodesian Tick Fever.—This disease exists at five native kraals in the vicinity

of the Ingwavuma Magistracy. 25 deaths occurred here during the month. I would draw your attention to the monthly reports of D.V.S. Hutchinson and Tyler, which show exactly the conditions on our Border. As regards D.V.S. Hutchinson's remarks that the disease is becoming "gradually acclimatised" to the High Veld, while the High Veld does—by reason of its being less favourable to the life of ticks, as compared with Low Veld—have a certain influence over the course of the disease, it has been found that veld may remain infected without the disease making its appearance, even with susceptible cattle on it for a very long period. This was pointed out in my remarks on the subject which appeared in the last issue of the *Agricultural Journal*. The fact that cattle have ceased to die, and no further cases have occurred for a prolonged period, after being removed to high veld, has led to the belief that the infection entirely dies out. This cannot be considered so.

I put up herewith reports from D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT,
P.V. Surgeon.

P.V.S. Office, Maritzburg,
19th Oct., 1903.

MARITZBURG.—D.V.S. HARBER.

Scab.—One fresh outbreak occurred in the Upper Umkomanzi Division.

Glanders.—One case. The animal was brought on the Market Square. As it showed clinical symptoms of the disease it was destroyed, and the owner—an Indian—is being prosecuted.

Anthrax.—Nine deaths reported. Four of these came under my own notice.

Horsesickness.—One typical case occurred at the Corporation Stables on the 6th ulto. The subject was a recently imported South American mare.

Mange.—This disease is rather common, and occasionally troublesome. Many cases exist among the natives' horses in the Zwaartkop Location. As there is some difficulty in making the owners carry out instructions, I have asked the Magistrate to inform them of the instructions, which he says he will do. One native was prosecuted under the Act and fined £1. One horse affected with the disease was destroyed at Camperdown. The animal was on the town lands unclaimed.

Vegetable Poisoning.—Many cases of tulip poisoning are reported, both in horses and cattle. I have seen a few cases in cattle which I attribute to another variety of vegetable poison, the chief symptom of which is partial paralysis of the hind extremities. The general health appears good, feeding fairly well; in some cases there are symptoms of excitability, eyes staring, and the animals occasionally pass a little blood with the faeces. In the majority of cases, treatment appears useless as the paralysis becomes complete, and death occurs from exhaustion. Other mild cases yield to a good purgative, followed with nerve tonics and stimulants, and a blister to the loins. The complaint attacks both oxen and cows in good or poor condition.

General.—I have been very busy during the month, the commonest cases I have attended are as follows:—Lameness, injuries, distemper (Colic), retention of foetal membranes (cows), parturition (cows and bitches), ophthalmia,

choking (cattle and horses), gastritis (dogs), removal of tumours, firing, examination of horses as to soundness (11), and castrations.

DURBAN.—D.V.S. AMOS.

The importations are the smallest on record since I took over duty at the Port, and the decrease is entirely due to the closure of all ports that have previously sent stock to this port.

The total number is 78 during the month, composed as follows:—

Horses	....	....	....	48
Dogs	....	....	....	14
Heifers	....	....	....	6
Calves	....	....	....	4
Bull	....	....	....	1
Lions	....	....	....	5
				78

Of the horses, 31 came from Australia, 17 from England. All the remaining came from England.

Lungsickness.—Four herds are still under license for this disease, and I am glad to report that only one beast has actually died from the disease during the month.

Glanders.—I am glad to report an entire absence of this disease for the past month.

Tuberculosis.—One bull was retested, and failed to react.

All ships arriving here from the Argentine with lucerne are still dealt with under your notice, *re* certificates for same before entering the Port, and the Port Captain is assisting us in every possible manner.

Tetanus has been fairly prevalent, and four deaths have been brought to my notice.

It is to be hoped the embargoes on cattle at present may soon be qualified or raised, so that the importation of cattle at the Port can again assume the normal.

GREYTOWN.—D.V.S. CORDY.

Lungsickness.—This disease was reported to exist on the Mission Lands at Muden, but fortunately on investiga-

tion, the cattle were found to be suffering from Gallsickness only.

Glanders.—None.

Rinderpest.—None.

Meltsickness.—Mr. Gifford, of Marchmont, Noodsberg District, reports he has lost three head of cattle from this disease, and also reports that his natives have been losing from the same cause. As this is a very fatal disease every precaution should be taken to prevent further loss when once a case has occurred. It is due to a well known microbe, and although not contagious in the ordinary acceptation of the term, it frequently causes heavy loss when once established on a farm. If, on *post-mortem* examination, this disease should be found to have caused death the safest method is to burn the carcase on the spot: if unable to do this bury it deeply. It is also advisable to fence round the spot to prevent further grazing at that particular place, as there is grave danger of infection if animals feed where the blood of an infected carcase has been allowed to escape. When a case has occurred, if further deaths should take place, it is advisable not to cut up the carcase, as by so doing the blood is allowed to escape, and so contaminate the soil, the microbes in the blood forming spores which can live outside the animal body for a very long period, and if taken up by an animal grazing over the spot, the disease is once more started. As it is communicable to the human being, care should be exercised not to get inoculated when making a *post-mortem*. On no account should natives be allowed to remove the meat for eating purposes, as it is not only a source of danger to them, but fresh centres of infection are likely to be started thereby. Although the digestion of a native would appear to rival that of an ostrich, several cases were brought to my notice, when stationed in Zululand, of natives having died through eating the meat of beasts dead from Meltsickness. When possible, it is advisable to change the grazing until the infected part of the farm has been burnt off.

Vegetable Poisoning, as might have been expected in such an abnormally dry

season, has caused several deaths among cattle.

Gall-sickness is reported to be the cause of 15 deaths.

Poverty is responsible for quite a number of deaths among cattle owing to the scarcity of food through the drought: in Riet Vlei alone about thirty cases being reported.

Mange in Horses.—A conviction was obtained under the Contagious Diseases Animals Act for allowing a mare and foal affected with this disease to run on the Town Lands of Greytown. I trust this will deter others from committing a like offence, as it is intended that this Law shall be carried out.

VERULAM.—D.V.S. SHARPE.

Lungsickness.—My district is still free from this disease.

Glanders.—I have re-tested the animals belonging to the Tongaat Sugar Company, Limited—in all, 21 horses and 112 mules. Of this number 1 horse and 5 mules reacted and were destroyed, and on *post-mortem* examination were found to be glandered.

I also had one case of Glanders at Umzinto. This was showing clinical symptoms, but fortunately it had not been out of the stable for some weeks. I destroyed it, and held a *post-mortem* examination, which verified the diagnosis. The stable was burnt and everything done by the owner to prevent infection.

Rinderpest.—As this disease still exists in Zululand, and the Tugela River is very low and fordable nearly everywhere, the guard is still kept on above the border, but I think when the river rises that the guard can be dispensed with, at least to a great extent.

Horsesickness.—There have been two reported cases of Horsesickness during the latter end of this month. Mr. Lonagan, of Stanger, lost one of his horses, and there was also another case reported from that district about the same time.

General.—Stock have felt the want of rain very much indeed, but considering the drought and consequent scarcity of

grass they are in good condition. There have been several cases of Gallsickness and of Quarter-evil, but farmers are inoculating for the latter.

I am glad to say farmers are busy building dipping tanks round this district, so I hope we shall be prepared for any emergency.

The North Coast Experimental Farm has been started in some land just outside Stanger, but only about 40 acres are at present under cultivation.

On the resignation of Mr. B. C. Shooter from the post of Stock Inspector, Alexandra County, Mr. R. Cruickshank, of Victoria Farm, Umtwalumi, has been appointed to the position.

LADYSMITH.—D.V.S. O'NEIL.

The past month has been an exceptionally busy one, owing to the various reports throughout the district *re* diseases amongst stock, which necessitated me visiting Springfield, Bergville, Acton Homes, Umsinga, Umahlomoya, Elandslaagte, and Van Reenen and other parts.

The reported outbreak of Rinderpest at Umahlomoya, which received my prompt attention, proved to be a case of redwater on *post-mortem* examination, and the other two cases at the same kraal was Gall-sickness. The animals were dosed, and showed indications of recovery before I left. At a kraal near by a young beast died from Anthrax.

Throughout the district there is a great scarcity of water, and the veld is very poor and dried up, with the exceptions of farms under the Berg, which afford sufficient grazing for stock. Farmers are leaving daily with their sheep and stock for the O.R.C.

Scab still exists throughout the district, and the stock inspectors are kept busy with same.

Lungsickness.—No fresh cases have occurred during the month, but an old outbreak is still under license.

Glanders.—Three clinical cases were destroyed during the month.

Quarter-evil has killed a number of calves and yearlings, and where inoculation was practised it proved satisfactory.

Mange in horses is dying out, as the owners are attending to them, as horses have now become valuable.

Vegetable Poisoning.—Several cases have occurred throughout the district, which is to be greatly accounted for by the continuance of the drought.

VRYHEID.—D.V.S TYLER.

Rhodesian Fever.—I am pleased to be able to report that up to the present our efforts have been successful. This is the more gratifying owing to the fact that during the month we have been able to more thoroughly organise our border staff, and as each man now understands the task allotted to him, and has become better acquainted with that portion of the border under his immediate supervision, we are in a much better position to keep the disease out of the district, or to deal with it if it gets in, than we were at the beginning of the month. Guards are in position along the whole border, and night guards are maintained at drifts and likely places for crossing cattle. The European guards also patrol the portions of the river allotted to them every day. All the guards, both native and European, have been obtained locally as far as possible; and on the lower parts none but men with local knowledge have been chosen. This was necessary owing to the fact that in such broken country there are many native footpaths and other places where cattle may be crossed, which are only known to persons very well acquainted with the district, and in the case of the native guards, also, because none but natives accustomed to low veld could live on the river.

Your instructions *re* the dipping of all animals entering this Colony from the Transvaal are being carried out, and such animals are only allowed to enter by Joubert's and Magudu's drifts. The movement of cattle in a zone of eight miles from the river has been stopped, and transport cattle entering this zone have to be dipped and freed from ticks before coming out again. The building of the dip at Paulpietersburg will facilitate this portion of the work, though the ordinary spray pump is a very good sub-

stitute, providing the number of cattle to be dressed is not too large.

I hear numerous reports of cases of the disease existing over the border, and visited one outbreak about eight miles over the river during the month. This was a case in which the owner of the cattle had lost the whole of his herd except ten, which had been separated from the rest of the troop, and removed to a clean patch of veld. This gentleman professed to have been familiar with the disease for the past seventeen years, and, according to his theory, it is a form of poisoning produced by too frequent burning of the grass, though as to why his cattle, after eating a poison on the low veld where they contracted the disease, should not show symptoms for weeks after, and after reaching his farm, he was not very clear.

I urged him to take the precaution of dipping his cattle, but do not know whether he did so; at any rate, I heard this week that the disease had broken out again, as was to be expected.

Should the disease obtain a strong footing along the Transvaal bank of the river it would be difficult indeed to keep it out of Natal, but I hope that the scarcity of cattle there will preclude any such great danger arising. The summary destroying of cattle brought over the river by natives has had a most wholesome effect, and I think any native who contemplates doing so will think twice about it now.

The river is very low now and presents very little obstacle to the crossing of stock, but with the onset of the rain we may look for improvement in this direction.

Rinderpest.—Rinderpest still has a good hold in the Babanango District, as the new Act has not had time to make itself felt in an outbreak of this size yet, but I hope to be able to report a considerable decrease in my next.

Lungsickness.—Three fresh licenses have been issued in Paulpietersburg District and one in Vryheid District during September, making the number of cases to each district five and two respectively.

Glanders.—A horse showing advanced clinical symptoms of Glanders was discovered by me on the Vryheid town lands, and another belonging to the same owner reacted to Mallein; both were destroyed. I am afraid that owing to such culpable negligence or ignorance, as was exhibited in this case, we shall have a considerable number of cases of this disease in the future.

General.—The only other case of death from disease during the month, of which I am cognisant, were two deaths from Gallsickness, and taken all round, the condition of stock is very healthy.

MOOI RIVER.—D.V.S. VERNEY.

Lungsickness.—No fresh cases of this disease have occurred in the licensed herds at Weenen, and so I hope we shall soon be able to raise the quarantine.

Glanders.—Two outbreaks of this very prevalent disease have occurred. One in a horse the property of Rev. Wm. Murray, Weenen—this horse was destroyed; the two remaining horses I tested with Mallein gave a negative result. The other outbreak occurred at Springfield, in two horses the property of Mr. Barend Van der Merwe; both showed well marked clinical symptoms. It is almost superfluous to add that these horses bore the east military brand, and further illustrates how exceedingly well the military authorities have succeeded in distributing glanders throughout the country. As to be expected with the prevailing drought there have been a considerable number of deaths from vegetable poisoning.

The infectious pneumonia of calves I spoke to you about recently broke out in a fresh lot of calves. I at once advised turning the whole lot out with their mothers and making a new calf pen. So far this appears to have had the desired effect. If any further cases occur I will let you know.

NEWCASTLE — D.V.S. HUTCHINSON.

Lungsickness.—Two fresh outbreaks, viz: One in Newcastle, and the other in Utrecht.

Scab.—Four fresh outbreaks—two in Dundee and two in Utrecht.

Glanders.—I destroyed a clinical case of this disease on a farm near Dundee. The owner (a Native) is being prosecuted for failing to report the case.

Mange in Horses and Goats is still rather prevalent throughout my district.

Tulip Poisoning has caused the deaths of a number of animals.

Rhodesian Fever.—Duty in connection with the Border for the prevention of the ingress of Rhodesian Fever has taken up the greater part of my time during the month. Every possible precaution to prevent the disease gaining admission to the Colony is being taken. All farms within the eight mile zone have been placed in quarantine and individual instructions given to all owners of cattle that no animals are to be moved from the farms upon which they are at present grazing.

I am glad to be able to report that no fresh outbreaks of this disease have taken place during the month in the Wakkerstroom District, Transvaal, and the infected cattle on the farm "Middlepunt" have stopped dying.

There appears to be an inclination in some places to look upon the disease with indifference, and to confound it with ordinary Redwater. Stock owners will find to their cost, however, should the disease gain access to their herds, that the fact of their animals being in possession of a Natal Redwater immunity will not assist their cattle to resist infection from this new disease in the slightest degree.

The most alarming feature about Rhodesian Fever is that the disease is apparently becoming gradually acclimatized to the high veld. In the first outbreak of this new disease, which occurred at Pretoria some eighteen months ago, practically all the infected

cattle died out without spreading the infection to other cattle running on the Town Commonage at the same time, but in the more recent outbreaks there the disease has evidently been able to propagate itself, and has spread to cattle that have been reared on the Town lands. During my visit to the Transvaal in November of last year for the purpose of securing information with regard to this disease, both Mr. P. D. Simmons and myself came in contact with cattle that had become infected on the low veld, and on their being moved to the high veld ceased to break out with the disease immediately the period of incubation had expired, i.e., about eighteen days after they reached the high veld.

In the recent outbreak on the farm "Middlepunt," close to our Border in the Wakkerstroom District, Transvaal, the cattle became infected near Piet Retief, and were then removed to a high plateau overlooking the Pongola Valley, but, irrespective of their being placed at an elevation of over five thousand feet, they continued to succumb to the disease for close upon two months, notwithstanding constant dipping. These cattle have now, however, ceased to break out, and if the dipping is maintained there is every possibility that the rest of the animals will remain in good health.

I have mentioned the above case for the purpose of shewing that the disease may eventually adapt itself to the high veld, more especially so during the summer months, and also for the purpose of pointing out to farmers that they are not absolutely secure against the inroads of the disease, although they may be fortunate enough to be in possession of farms situated on the high veld.

Some of the opinions arrived at, as to the true nature of the disease, are interesting. A prominent farmer from the district, who had seen the disease, was heard the other day positively asserting that it was simply brought about by the indiscriminate burning of grass at wrong times of the year.

Others again still adhere to the opinion that the disease is virulent redwater, lungsickness, and gallsickness combined, but experiment has shown that animals possessing natural immunity against all of these diseases still remain assusceptible to infection as other cattle given to all or any one of the above-mentioned diseases. That the disease is a new and distinct type of blood disease (at least to this part of South Africa) is now, I think, above question. This was the conclusion arrived at on conducting my first post-mortem examinations in company with Mr. P. D. Simmons, of Natal, and so far, subsequent facts, and information gathered, have tended to strengthen that opinion.

HOWICK—D.V.S. WEBB.

Lobular Pneumonia.—This case was in a cow and aroused a certain amount of suspicion in my mind as to whether the disease might not be Contagious Pleuropneumonia. I did not feel justified in keeping the case under observation long enough to make a definite diagnosis as the owner wished to send cattle from the farm on to a public stock sale, so I had the animal slaughtered and held a post-mortem examination. Both lungs revealed a lobular pneumonia, a portion of one lung was forwarded to the Government Bacteriologist for microscopical examination, but no cause for the lesion was demonstrable.

Fractured Metatarsus.—A heifer had broken its leg below the hock. After a considerable lapse of time, as no union had taken place, I was asked to see if anything could be done. The bone was completely fractured, the skin broken on two sides and the wound suppurating. The only treatment likely to be beneficial was to amputate the leg below the fracture. This I did and the heifer has done well. As soon as the stump has healed, the owner will endeavour to replace the leg with a wooden one.

Difficult Parturition.—A cow had been trying to calve for 48 hours. The owner and several natives had tried to

remove the calf without avail. I was called up to attend the animal at 2 a.m., reached the case at 4.30 a.m., and found her still looking fairly bright and occasionally straining. The two forelegs of the calf were presented, the calf was lying upside down with the head turned back. I removed the whole of both forelegs, leaving plenty of skin, to which ropes were attached, pushed the calf back into the womb, and after considerable difficulty managed to pass a cord with slip-noose over its head. By getting assistants to pull on this, at the same time that I guided the head with my hand, I at last got it into position. After turning the calf into its normal attitude, it came away under slight traction without further difficulty. The delivery took about two hours; the cow recovered after careful nursing by the owner.

Vegetable Poisoning.—A considerable number of cattle running on the lowland under the Karkloof range have been poisoned during the month. The herb which has been blamed, is called by the natives "Njauba." A large quantity of this herb grows in the district named, it reaches a height of from 6in. to 2ft. and has a stem resembling an onion; it looks to me as though allied to the well-known "Tulp" or "Tulip." I have forwarded a bundle of the plant to the Government Bacteriologist for a feeding experiment, so that the question as to whether it has poisonous properties or not may be definitely known.

Symptoms shown by cattle supposed to be poisoned with this herb are as follows:—In acute cases death is very rapid, the large stomach becomes distended with gas (*hoven*), the beast is seen to be quivering at the flanks and about the mouth and nostrils severely, and the animal quickly succumbs. In less acute cases the *hoven* will subside, the fæces passed are foetid and mixed with clots of blood, the animal will walk with a staggering gait and will walk into any object without apparently seeing it.

If taken in time a few cases will recover; it seems almost fatal to give a

purgative dose of salts. I have had the best results with an emulsion made with Sodium Bicarb. dissolved in water and then mixed with half-pint doses of linseed oil, to which is added 1 to 2 ounces of Tint. Opii. In some cases it is advisable to puncture the rumen and allow the gas to escape. .

IXOPO—D.V.S. POWER.

Mr. Wilson, Stock Inspector, Polela, has tendered his resignation. I hope two appointments will be made for this District as at present it is much too large for one man to satisfactorily perform the work.

Lungsickness.—Nil.

Glanders.—Nil.

Tulip Poisoning.—A serious case, resulting in the loss of 16 in-calf cows, occurred a few days ago on the Polela road, when 150 head of cattle were being driven from Ixopo to Polela. The herd camped for a night on a notoriously

bad spot for tulip, and the following morning the majority of the animals were suffering from the effects of the poison. The owners treated them with epsom salts, carbonate of soda, and burnt tulip root.

Unfortunately, I did not see those cases, as I was away at the time and did not receive the message until too late, and at present am not in possession of further details.

Umbilical Herina.—Have had a case in an imported bull, and owing to the close proximity of the penis, it is a difficult matter to fix clamps or needles so as to keep the bowel returned without causing undue pressure on that organ.

Dipping Tanks.—I am pleased to say that numbers of farmers in this District are combining to erect private Tanks. The idea of having Tanks along the main road is a good one, and I hope in the course of a week or so to be able to give you all particulars as to suitable sites, etc.

The "Northern Star" and other New Potatoes.

THE following extract from an interview with Mr. Titus Kime, a well-known Lincolnshire potato grower, may be of interest to our readers who are experimenting with new varieties of potatoes. The interview is published in the *Agricultural World* of 22nd August last :—

"It is two years ago, is it not," I asked, since Northern Star was first heard of?"

"Yes," replied Mr. Kime. "Mr. Findlay had raised a small stock of it then, which he sent out in lots of seven pounds. He would not let anybody have more than that of it."

"Last season, however, you were able to buy more largely?"

"I paid Findlay £500 for a ton, and I bought other lots besides."

"And how much of it did you sell last season?"

"I sold just under 24 cwts. for £1,035."

"It is said to be remarkably vigorous. Can you give me one instance from your own experience?"

"Last season I planted one-sixteenth part of an acre with 22 lbs. of Northern Star. I had 14 rows, and 35 roots in a row. The yield was 15 cwts. I sold that little lot for £100."

"How much room do you generally give Northern Star?"

"The rows are 30 inches apart, and the setts 24 inches apart. On my finest plot of Northern Star, I left a pathway down the middle six feet wide. When I returned here early in August, from a fortnight's holiday at Bournemouth, that pathway could not be seen. The potatoes had branched out so that it was completely covered."

"To make the most of the seed, I suppose you plant every eye separately?"

"In some cases I have planted from

single eyes, and in other cases from sprouts."

"How did you grow the sprouts?"

"We started the sprouts in pots about February, but that was not so soon as we ought to have started them. Five sprouts were put in each pot, four near the sides, and one in the middle. They were started in a greenhouse, but with very little heat. When they began to show tiny green shoots they were put into single pots and stood out of doors, being protected, of course, in severe weather. Later on they were planted out in rows, great care being taken not to disturb the roots."

"Have the sprouts grown as satisfactorily as the eyes?"

"There is so little difference that now I cannot tell which are which. Four thousand of the setts are from sprouts. You may be interested to know that all the potting of these valuable sprouts was done by Mrs. Kime and myself."

"What weight of seed did you use for your best plot, that acre which has attracted so much attention?"

"It is not quite an acre. Not more than 4 cwt. of seed was used for that. Mr. Findlay estimates that the yield will be 24 tons. It is one-half of that plot with which I have made my challenge."

"Do you mind telling me exactly how you prepared this particular acre of land?"

"If I do I shall be giving away the result of my 30 years' experience of potato-growing, and some people may think that is very foolish of me, but never mind. Here is the history of it. I was determined to prepare that acre just as well as I knew how. The previous year I had grown mangel-wurzel seed on it, and bulbs the year before. I started manuring it last autumn, by ploughing in 10 loads of crewyard manure. It was ploughed in five or six inches deep. Then I put on 20 tons of rubbish. I must explain what I mean by that. My land grows a great many weeds, in spite of all I can do to prevent it. I don't burn this rubbish as a rule. I make it into heaps. It is turned over from time to time, and when it is thoroughly rotted I apply it to

the land. Well, as I have already said, 20 tons of this rubbish was carted on and ploughed in. Then I again manured it with 10 tons of crewyard manure. After an interval, I applied another 20 tons of the rotted rubbish. Then I applied, as a top dressing, 10 cwt. of pure steamed bone, and 4 cwt. of nitrate of soda. Potash was applied in the form of burnt rubbish."

"That brings us down to the time of planting."

"Yes, and now I will tell you how they were planted. In the first place, I must say that we use, for making the hole, not a spade, but an ordinary shovel. A good big hole is made with this. Then in the bottom of the hole is thrown a handful of the burnt rubbish, and on the top of that a handful of wheat chaff. The eye, or the sprout, is carefully planted in the middle of this warm bed."

"You are convinced that Northern Star is a really good potato?"

"There can be no doubt that it is the best maincrop Findlay has ever brought out; it crops well, cooks well, and looks well. It is the most vigorous potato I have ever known in my experience of 30 years."

"It will probably take the place of Up-to-Date?"

"Yes, Up-to-Date is now past its prime. Its successor has been found in Northern Star."

"Then you would not advise any enterprising farmer to continue growing Up-to-Date?"

"My advice to such is to grow all the Northern Star they can afford to buy. It will be two or three years before the potato can come into the market for eating. Meanwhile, there will be a great demand for it for seed. With regard to Up-to-Date, I should like to say that, in my opinion, that potato and Garton's Abundance Oat have been two of the greatest blessings agriculturists have ever had."

"Is there any other exceptionally good new potato in the market?"

"Yes, Sir John Llewellyn. This is in its third season, and its success is now perfectly assured. There is no disease about it, and for quality, shape, and crop-

ping powers it is the best early potato extant. This year I began cooking it in the middle of June, and it has been all along of excellent flavour and firmness. I have tried it by the side of other earlies, and it has beaten them all."

"Has there been a great demand for this potato?"

"Last season the demand was so great that growers could not be supplied. I feel sure that the same thing will occur again in the coming season."

"It is not yet in the market for eating?"

"No, but I expect a few of them will be eaten next year."

"When I was here two years ago, you thought very highly of Evergood and Ninetyfold—it would be interesting to hear whether you are still of the same opinion?"

"Evergood will come on the market this year for eating. Up to the present, the ware and the seed have all been used for increasing the stocks. I have 30 acres of Evergood. It is maintaining its character, and will carry us on, for general purposes, till we get Northern Star in the field. Evergood came out at about 1s. pound, but it was worth ever so much more. The next year I bought a ton for £65. Last year the price averaged from £12 to £15. This year my idea of price is that it will make about £5, seed and ware. With regard to Ninetyfold, I think the price of that will also be about £5 this year. It will be largely used for boxing purposes. It grows a good weight of stuff by the end of July. If allowed to ripen, it is liable to disease. It should be marketed before the middle of August."

"How many acres of potatoes for seed purposes are you growing yourself this year?"

"Seventy acres, but I buy a great many besides."

"As you are not likely to grow any unprofitable sorts, I should be glad to have a list of what you do grow?"

"Certainly. My Earlies are Sir John Llewellyn, Ninetyfold, Puritan, Sharpe's Victor, and Duke of York. Second Earlies: British Queen, Royal Kidney, and Elephant. Maincrop: Northern

Star, Evergood, Royal Kidney, Good-fellow, Empress Queen, and Up-to-Date."

"Is there anything you would like to say about these varieties?"

"I consider that Royal Kidney is a very good late second early, almost a maincrop. It is a very nice-looking potato, with an excellent flavour. Good-fellow is good, sound, all-round maincrop potato. I am certain that Good-fellow, Empress Queen, and Evergood were all produced from the same stock."

"Have you many potato trials?"

"I try all the new varieties, and some from the Continent as well. The majority of them I discard."

"Then you cannot recommend any other new varieties?"

"No, only Northern Star and Sir John Llewellyn. Those are the best, bar none."

Copenhagen, the Duke of Wellington's famous charger, was a grandson of the great Eclipse, being by Meteor, but he had a stain in his pedigree on the dam's side. Copenhagen was foaled in 1808, and had a short but unsuccessful career on the Turf, running several times in 1811 and twice in the following season. Having been withdrawn from the racecourse in 1812, General Grosvenor, who bred him, gave Copenhagen to the Duke, who rode him during the Peninsular campaigns, and, as we all know, at Waterloo. He proved a much greater success as a charger than a racehorse, as he had great endurance; no day was too long for him, and on one occasion the Duke rode him for seventeen hours on end.

Mr. William Sanders, Director of the Dominion Experimental Farms, says, "While Canadian farms are producing annually increasing quantities of grain, these, with the exception of wheat, are being mainly converted into animals and their products, which contribute the principal item of export. The increase in the manufacture of dairy products has been very helpful to the cattle trade, and at the same time it has prevented a rapid development of the swine industry. . . . By exporting animals and their products, in place of coarse grains, the elements of fertility taken from the ground by these crops are largely returned in the manure of the animals, and thus the fertility of the land is kept up."

Pineapple Culture.

IN the "Queensland Country Life" Mr. J. H. Rehnzell writes:—What can be done with the mile of sandy waste which exist along the south and north-coast railway lines, and also numerous islands in Moreton Bay and other centres, was shown to me last month. Along the east-coast railway line, which traverses Florida, from 28 degrees north latitude southward, the pineapple belt stretches, chiefly where spruce pine lands existed. For years this grey sandy waste was taboo to fruit growers and farmers, but when a knowledge was gained of the action of fertilisers upon free soil, attention was turned to improving this huge sand bed. Now several train loads of splendid pines are sent away daily during the shipping season, and huge fortunes have been made in the business.

THE PINEAPPLE.

The plant belongs to a peculiar family known as bromeliaceae. These bromeliads are essentially tropical, and most of them epiphytes, *i.e.*, they grow upon trees, deriving their nourishment from the air. It seems impossible that the long grey "Spanish moss" that hangs upon the trees can be related to the pineapple, but a comparison of the two flowers show that they belong to the same family. The pineapple blossoms, which are purplish blue, appear chiefly in January and February, and the "fruit" ripens about four months later. The fruit that we eat, however, is not connected in any way with the seed. It is not a product of the flower, but is in reality a huge aggregation of flowers and bracts.

SOIL AND CULTIVATION.

The selection of the land is the most important problem connected with successful pineapple growing, for the pineapple cannot endure wet feet, while frost will ruin a crop in a night. Here along the pine barrens the land has proved to

be ideal. A first look at the soil used would make a grower in Queensland roar with laughter. The kind of soil used is not simply absurd, its preposterous. It looks like pure sand, such as one sees going from Mackay to the beach, and down along the coast road to Broad-sound. As a matter of fact some of it contains nearly 99½ per cent. of substances which are quite involuble even in strong acids. Fancy raising a crop of fruit from soil only one two-hundredth part of which is soluble in water! Yet it is done, and last year Florida produced about 4,000,000 pines for market from these once barren lands. The mystery is easily explained. They have an ideal base for the cultivation, *viz*: free drainage, and the art of fertilizers is thoroughly understood.

THE GREAT PROBLEM OF FERTILIZERS.

In the south eastern part of the United States the use of commercial fertilizers has more nearly reached the stage of exact science than anywhere else in this country. The subject is large and complicated. The Florida Experiment Station has published a bulletin, over one hundred pages, devoted entirely to fertilizers for pineapples. We have learned that nitrogen from an organic source is better for pineapples than nitrogen from inorganic sources. Sulphate of potash is better than muriate of potash. Bone meal seems to yield a sufficient amount of phosphoric acid. A complete fertilizer would be about as follows:—Two hundred pounds of dried blood, two hundred and fifty pounds of low-grade sulphate of potash, and one hundred and fifty pounds of bone meal. This is about the right quantity for the first application to an acre of twelve thousand plants. The fertilizer is sprinkled between the rows, and then worked in with a scuffle hoe. The first application may be made eight or ten weeks after the field has been planted, and the next about January or February.

After the field begins to bear, applications of the above mixture should be made immediately after the crop is marketed, and again about January or February.

PLANTING.

About twelve thousand plants of the Red Spanish variety are set out to the acre, and in the course of eighteen months 50 to 75 per cent. of plants will produce fruit. Under very favourable circumstances, by selecting the finest suckers, and planting out at the earliest opportunity, a larger percentage of the plants will fruit. The plants which have fruited usually produce from one to four new plants. All but two of these to each plant are removed for setting out. The suckers which are left on the parent plant produce the second crop a year later, so that for a second crop it is not unusual to harvest fifteen thousand, or more, fruits from the acre which has been set out to twelve thousand plants.

In the piney woods and the spruce-pine land, the favourite method of planting pineapples at the present time is to lay the ground off in beds of about six rows, the rows being planted about twenty inches apart, the plants about twenty inches apart in the row. Fields laid off into these narrow beds are much more cheaply worked and fertilized than when laid off in a solid block.

SHED SYSTEM OF CULTIVATION.

One of the greatest factors in the success attained in Florida has been the introduction of the shed system of cultivation, and now over hundreds of acres stretch low shedding, equalising the temperature greatly the whole year round. The best pines are raised under these sheds—and the expense of building a shed usually staggers a beginner—it is something like £80 per acre.

The pineapple "shed" is a modified form of greenhouse, the roof of which has as much space open as covered, it is about 7 feet high, and built of hardwood and pinelaths. The object of the shed is to reduce the temperature in summer.

and increase it during the winter. The advantages of shedding are these: (1) An increased amount of nitrogen is developed in the soil; (2) the texture of the fruit is improved; (3) the size of the fruit is increased about twenty-five per cent.; (4) the temperature is reduced in summer, and increased in winter. Many acres are now shedded where the danger from frost is quite remote. One of the largest sheds at the present time shelters a half-million plants, and covers forty acres. The cost of such a pineapple shed is about £80 per acre. This, of course, may be considerably reduced as the area is increased. The following bill of lumber gives approximately what it takes to build a shed for a single acre:—463 posts, 4 by 4 inches by 9 feet; 266 stringers, 2 by 6 inches by 16 feet; 5,900 laths, 1 by 3 inches by 16 feet, for cover; 450 boards, 1 by 12 inches by 16 feet, for sides.

METHODS ON THE FLORIDA KEYS.

The Florida Keys are famous for pineapples. Here the growers set out their plants in a mass of rubble, equalled only by the refuse from the rock-quarry. Sometimes there is no leaf-mould left after cleaning, and it becomes necessary to brace the newly set plant on all four sides with rocks to keep it from falling over. No cultivation is given, as it is impossible to use a plow or even a hoe. Young plants are usually set out within a few weeks after the crop on the old field has ripened, and are allowed to have their own way for several months, when labourers are employed, who use large knives to cut out the weeds that may have sprung up, or whatever shrubbery may not have been killed by burning over in clearing. It may be necessary to go over the field again before the first crop comes in, but ordinarily, one weeding is sufficient. In this section it is impossible to plant in rows, as the plants have to be set out wherever possible at convenient distances from each other. By the time the second crop is ripening, the foliage will be so dense that the ground is completely shaded. Fertilizing is not practiced in this section.

The pineapple plantation on the Keys produces crops for from five to ten years, when the field is said to be "run out." Then Nature is allowed to claim her own, and the sturdy "Conch" moves on

to a new field. Unfortunately, the ambitious from other sections of the country have entered the field, and the end of this comfortable system is practically in sight.

Up-Grading Butter.

MR. G. S. THOMSON, F.R.S.E., South Australian Government Dairy Instructor, has recently returned from an Old World trip, and in his notes to butter-makers in the *South Australian Journal of Agriculture and Industry* speaks of some phases of dairying in Denmark that are of general interest. Amongst other things he says:—

VALUE OF LIME WATER.

Having enjoyed the privileges of testing the samples of butter at Copenhagen, I was surprised to find a marvellous equality throughout the vast number of casks. My endeavour was now to ascertain how this distinguishing feature of Danish butter was maintained, and with that object in view I left for the country districts to study the question on the spot. Calling at the farms first, I soon recognised that care in milking was receiving very strict attention by a few of the farmers, and a system of milk cooling was, in a great majority of instances, practised. Beyond the latter element in milk preservation, nothing else of special interest to the butter-maker was in evidence. Proceeding to the factories, my attention was at once drawn to the perfect cleanliness of the buildings, machinery and utensils. The air in the rooms had a feeling of purity and sweetness, and everywhere one found illustrations of the factory worker's sense of responsibility of the dangers of germ life, and how to successfully enforce preventive measures against the possibilities of bad odours in the factory. The very wide application of limewater to utensils, and hot lime to the inner walls of the buildings, is an important factor in the manager's education, and I did not

find one instance of neglect to enforce one of the most valuable practices in Danish dairying. One man remarked to me that factories were drenched in the solution every day of the week, and from my observations there was no exaggeration in the statement. The question arises: If the experience of the Dane goes to prove that taints have quickly disappeared in their cold climate since the uses of lime became general, why should we not have a much greater reason to adopt the system in a climate of far higher temperatures, and with factories less favourably constructed to ensure freedom from hurtful smells. Our butter-workers, pounders, wooden and iron utensils, and principally churns, do not possess that sweetness of smell which is so desirable in successful butter-making, and so characteristic of every item in the equipment of a Danish factory.

CREAM RIPENING.

The universal adoption of pasteurization has undoubtedly been instrumental in bringing the dairying industry of Denmark to its present flourishing position. Cream ripening by natural fermentation is a thing of the past, and to-day the factories are supplied with a standard culture, specially prepared at the Government laboratory. A similar treatment of the milk at all the factories—the introduction of the same culture to the cream, an equal care in ripening, churning, and working have given the butter uniformity in flavour, which has captured for Denmark the highest position in the market of Britain.

Cream ripening, which decides what the flavour of the butter is to be, has

reached to a science of the greatest importance, and the Danish butter-maker makes a close and careful study of the conditions necessary to secure a successful acidity, while the chemical and bacteriological changes in the cream are not neglected. A special apartment is allotted for this branch of the manager's work, and upon no account is anything permitted to interfere with true lactic development. We are decidedly weak in this department of work, and although pasteurization and pure cultures cannot be brought into use in many of our factories, more conveniences might be given for the better treatment of cream for churning. The losses occasioned in South Australia through unsuitable rooms for ripening purposes must be deplorable, and the efforts of directors to remove defects in their factories should be at once directed to this great source of evil. Larger cream vessels are required, fitted with stirring rods, having a disc at bottom for use in cream at intervals during ripening.

GRADING CREAM.

Most of the milk in Denmark is carted to the factories in drays, which go around and collect the cans at suitable places along the route. Upon arrival at the factory, the supplies are closely examined by the manager, who puts on one side any objectionable sample, which is either used for second-class butter or returned to the farmer. In the case of cream, inferior qualities are churned separately, and the butter dare not be used for export purposes, otherwise the reputation of the factory will suffer, and if repeated many times the public would regard the offence in a most serious light. So careful is the Dane in preserving the name of his country in the London market, that only the choicest quality is exported to London, while the second rate article is consumed in Copenhagen. In further support of the trade thousands of tons of foreign butter reach Denmark annually to supply the wants of the population at a cheaper rate, and thereby add to the prosperity of the industry and country. The opposite is the practice followed here. We consume the best butter our-

selves, and export what is not required. We are careless in grading; good cream, and cream of medium quality are churned in one lot, and the produce exported as the choicest. It follows that the butter leaves our shore with a blemish, not strong enough to condemn it before shipment, but sufficient to cause it to become objectionable when it reaches the consumer in the Old Country. To make this thoroughly understood: the good cream predominates over the inferior, it has imparted its choice flavour to the butter which is retained for a few days, but when the keeping qualities of the supply is severely taxed the injurious influences of the second grade cream will be noticeable throughout the body of the butter. Factory managers must cultivate a keen palate and be able to recognise the true aroma of well ripened cream, and know when to churn and get the best quality and quantity of butter. As in cheesemaking, a study of flavours is necessary, commencing at the milk and ending in the manufactured article. I would earnestly appeal to all factories to enforce a judicious system of grading cream and butter, so as to ensure some protection against further injury to our export trade. We have something to learn in buttermaking, and we know much that would greatly benefit us and raise our position, but it remains undone.

This is from a lady's description of the great horse fair held at Batesar, in the North-West Provinces of India:—"I was horrified at the way the native horses were treated. A native is never satisfied with his horse unless the animal arches its neck till its chin almost touches the throat, and to achieve this end the poor horses had villainous bits covered with little spikes put into their mouths, and then their heads so tightly tied back that they could hardly move. There were a great many piebalds, strawberry, and oddly coloured horses among the 10,000 animals at the fair, for there are certain marks and colours which a native considers 'lucky' and delights in, and very often a rajah's whole stud will consist of the most grotesque and extraordinary looking horses. Sometimes the natives dye their horses' legs, manes and tails, and dab little spots of colour over their bodies. They also dress them up in the most laughable way, and hang necklaces of beans round their necks and fetlocks.

Notice to Stock-owners.

LOAN FOR THE CONSTRUCTION OF DIPPING TANKS.

THE Government will be prepared to receive up to the 31st December, 1903, application from Stock-owners and others desirous of constructing Dipping Tanks for cattle.

Applications for loans are to be addressed to the Secretary to the Minister of Agriculture, Pietermaritzburg. Each application must contain the name and address of the applicant, and of a person who is willing to be bound as surety, and must also give particulars of the site, dimensions, etc., of the proposed Tank, and its probable cost.

No loan will exceed £100. The Government reserves the right to refuse any loan, nor will any application be entertained unless the applicant and his surety are approved by the Government.

The loan will not be paid over until the tank is reported upon by a proper officer of the Department of Agriculture as having been completed to his satisfaction.

Each loan shall bear interest at the rate of £5 per cent. per annum, and shall be repayable in four annual instalments, and shall be secured by four promissory notes made by the borrower in favour of and endorsed by the surety.

Such promissory notes shall be payable respectively at the end of the first, second, third, and fourth years from the date of the loan, and each shall be for one quarter of the loan together with the interest calculated at the due date.—
e.g. :—

Loan of £100 made on 1st December, 1903.

First Promissory Note, £30 payable 1st December, 1904.

Second Promissory Note, £28 15s. payable 1st December, 1905.

Third Promissory Note, £27 10s. payable 1st December, 1906.

Fourth Promissory Note, £26 5s. payable 1st December, 1907.

Loans may be made on the above terms either to individuals or to several joint applicants. The owners shall be at liberty to charge for the use of their tanks, which will remain their own property.

W. F. CLAYTON,
Minister of Agriculture.

Department of Agriculture,
Pietermaritzburg,
27th October, 1903.

Notice to Stock-owners.

COMPULSORY DIPPING.

THE attention of Stock-owners is directed to the provisions of Act No. 32, 1903, "For Preventing the Spread of the Disease known as Rhodesian Red-water," and especially to Clause 6 thereof, which reads :

"6. It shall be lawful for the Minister to order that all cattle in the Colony or in any portion thereof, and such other animals as he shall determine, shall be dipped or dressed at such time or times, and in such manner as he may prescribe for the purpose of destroying ticks."

It is hereby notified that, at any time

subsequent to two months from the 31st day of December, 1903, I may, when it is deemed necessary, put the said Clause into operation without further warning.

Persons, therefore, who are desirous that their stock shall not be driven long distances to be periodically dipped at Government tanks, are counselled to at once proceed to erect their own tanks, either individually or in combination with their neighbours.

W. F. CLAYTON,
Minister of Agriculture.

Department of Agriculture,
Pietermaritzburg,
27th October, 1903.

Educational Notice.

FARM SCHOOL GRANTS, 1904.

TO encourage the instruction of the Children of Farmers and others who reside so far from a Government or Government Aided School that they cannot avail themselves of the education therein provided, the Government is prepared to pay, on the following conditions, during 1904, grants in aid at the rate of Three Pounds (£3) for each pupil below Standard VI., and Four Pounds (£4) for

each pupil in Standards VI. and VII. A higher grant in aid at the rate of Five Pounds (£5) for each pupil below Standard VI., and Six Pounds (£6) for each pupil in Standards VI. and VII., will be paid if the teacher be properly qualified and receive a salary of not less than £50 per annum, with board and lodging.

Forest Transplants for Sale.

TO encourage tree-planting, Transplants and Seeds of Forest Trees are supplied by Government, so far as in stock, at the undermentioned rates, exclusive of carriage, from the Government Nursery, Central Experimental Farm, Roit Spruit.

Transplants of Eucalypts, Pines, Acacias, Casuarinas, Cupressus, &c., about 25 trees in each tin, at 8s. 4d. per 100 trees.

Transplants of scarce kinds, larger trees, or surplus stock, when available, will be charged at special rates, which will be furnished on application.

Tree seeds, in variety, at 1s. per packet. Price per pound, which fluctuates, will be furnished on application.

Orders for present or spring delivery

should be addressed to the Conservator of Forests, Pietermaritzburg, and must be accompanied by a remittance in cash or postal order. Cheques cannot be accepted.

T. R. SIM,
Conservator of Forests.

Office of Conservator of Forests,
13th August, 1903.

[In connection with the supply of transplants of forest trees to the public, by the above re-published notice, attention is drawn to the large number of letters which become subject to delay through being addressed to the Manager of the Central Experiment Farm instead of to the Conservator of Forests, Pietermaritzburg.—Ed., *Agricultural Journal*.]

Government Notice.

GIANT'S CASTLE GAME RESERVE.

NOTICE is hereby given that preliminary steps are being taken by the Government for the establishment of a Game Reserve on the Crown Lands in the neighbourhood of Giant's Castle. Mr. Sydney Barnes has been appointed as Ranger of the Game Reserve, and any

person shooting or hunting over the lands in question will be proceeded against according to Law.

J. W. F. BIRD,
Acting Principal Under Secretary.
Colonial Office, Pietermaritzburg,
19th October, 1903.

Quarantine Notice.

IT is hereby notified, for general information, that in terms of Section 2 of Act No. 32, 1903, an Act "For preventing the spread of the disease known as Rhodesian Redwater," I have ordered the quarantining of all cattle within the area defined in the Schedule hereto appended, for a period of six months from the date hereof.

Any cattle which it is wished to remove from such quarantine area must be dipped or dressed to the satisfaction of an officer of the Veterinary Department before being removed.

W. F. CLAYTON,
Minister of Agriculture.

Department of Agriculture,
Pietermaritzburg.
17th October, 1903.

SCHEDULE.

Quarantine Area bounded on the north by the border between Natal and Transvaal, and on the south as follows:—

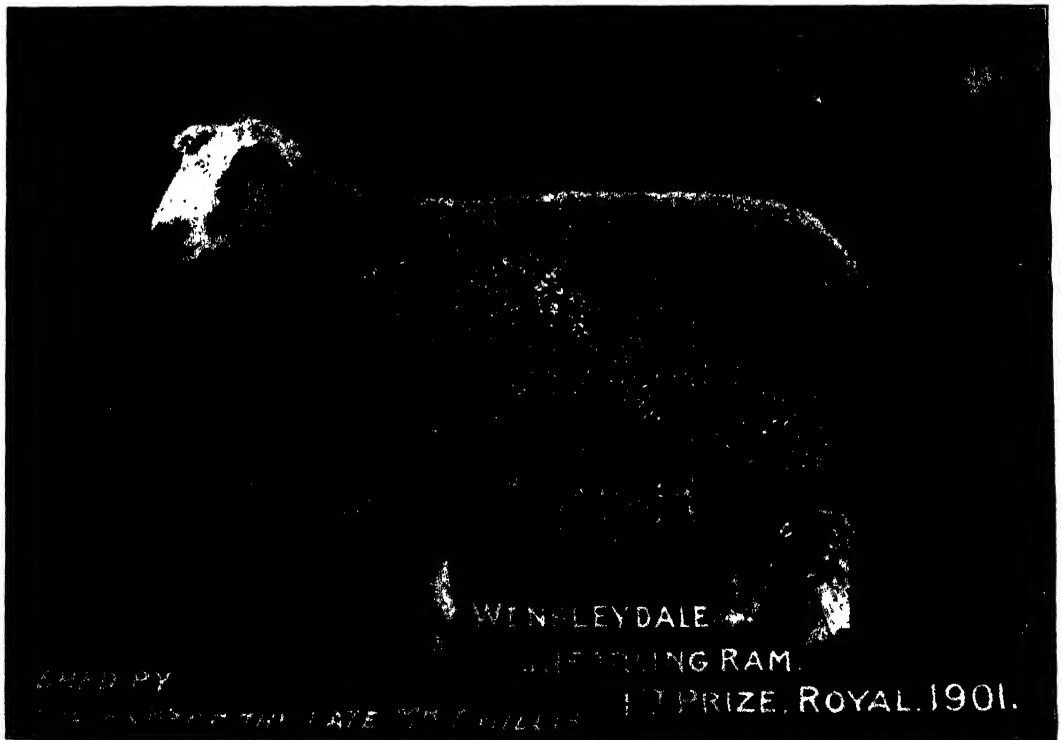
From Zululand border along Mkusi River to the eastern boundary of farm Mooi Plaats (255); thence along eastern boundary of farm Mooi Plaats (255) and southern boundaries of farms Umhlope (443) and Berdina (399); thence along eastern boundary of Mooi Bank (378), thence along southern boundary of Heeltevreden (573); thence along the eastern and southern boundaries of farm Langverwacht (493); thence along the eastern boundary of farm Tochgevonden; thence along southern boundary of farm Onvermacht (395); thence along the eastern and southern boundaries of farm Eldorado (13); thence along western boundary of the farm Eldorado; thence along southern boundaries of farms Eengevonden (582) and Dwaaihoek (105); thence along western boundary of farm Dwaaihoek to the Pivaan River; thence along Pivaan River to its junction with the Remvan River; thence along

the Remvan River to the southern boundary of farm Marthinus Drift; thence along southern and western boundaries of farm Marthinus Drift; thence along southern boundary of farm Nooitgedacht (73); thence along southern and western boundaries of farm Bosjeskrans (69); thence along southern boundaries of farms Mooihoek (34) and Uitkomst (38); thence along western boundary of farm Uitkomst; thence along southern and western boundaries of farm Deespruit (56); thence along southern boundaries of farms Schaikhoeck (40) and Rooipoort (97); thence along western boundary of farm Rooipoort; thence along eastern boundary of farm Verdehof (17) to the boundary between Utrecht and Wakkerstroom Districts of Natal; thence along boundary between Utrecht and Wakkerstroom Districts of Natal to the Buffalo River; thence along Buffalo River to northern border of Natal.

Mr. A. D. Carey, who made a journey in Turkestan some seventeen years ago, remarks on the general use of ponies by the agriculturists of that country; the people, he said, seemed "quite incapable of walking." He saw the labourers who attended to the irrigation channels riding about with long sticks with which they cleared the water ditches, without dismounting. A woman would get on a pony to go 200 yards to milk her goats; and Mr. Carey noticed that "men who were far too drunk to walk, or even to stand, seemed quite safe as soon as they had been lifted on to their ponies."

"The West India Committee Circular" for June 8, mentions that "Mr George Hughes, to whom the credit for the invention of 'Molascuit' is due, states that it is most desirable that the proportions of 20 per cent. dry megass meal and 80 per cent. of molasses, minimum 40 degrees B., should be carefully adhered to, and that the moisture in the manufactured article should be kept round about 15 per cent. There should also be uniform weights in the bags. If these points are carefully carried out, they will greatly facilitate the development of the business by creating confidence in the buyers."

WENSLEYDALE SHEARLING RAM.



FIRST PRIZE ROYAL. 1901.

Bred by Executors of the Late T. Wills.

(See Article.)

By the courtesy of Messrs. Cooper & Nephews.

Polela Agricultural Society.

On the 20th inst., at Highbury Hotel, the Annual Meeting of the above Society was held. From the report of the President, Mr. J. Finlay Alexander, we take the following:—Gentlemen,—Another year in the life of our society has rolled by, and as the Annual General Meeting which is being held to-day marks the commencement of yet another year, we must congratulate it on its fourteenth birthday. During the past year, as regard shows, our district was the happy mother of twins—in the show held at Bulwer, and the show at Himeville—and both of these exhibitions were a credit to their parents. . . . All members must have read with interest the various letters which appeared in the newspapers and the *Agricultural Journal* regarding the question of judging at shows. This matter has been getting of graver moment with each year of the life of our society. Situated as we are, remote from railway communication, and from other agricultural societies with whom we might otherwise be able to reciprocate, our executive has found it more impracticable each year to fill the list of judges. This is a subject which our society will require to take up and endeavour to find some solution for the obviation of the difficulty. I know that our honorary secretary has had to write to as many as ten different gentlemen before he could obtain one single victim, and when this judge is at last obtained, how do we treat him? Well, he comes and goes a long distance at his own expense, we work him hard all day, we generally let him pay for his own hotel and for his stabling expenses. He certainly gets a rosette for his coat, and probably a little abuse from the dissatisfied, but lately we have actually done away with the time-honoured show dinner, at which we had at least an opportunity of patting a judge on the back, and singing "For he's a jolly good fellow." In these latter days we have the professional beauty—America has just instituted the professional bridesmaid—and unless

another solution is found to this problem, we may need to come to the professional agricultural show judge, although, with a little more consideration shown and gratitude for the services rendered, we may still be able to maintain the old brand.

In regard to the exhibits of produce at our shows, it has been pointed out to me that it is quite eligible under our existing rules to show exhibits for competition of a former year's growth, say in the matter of oats. It is well known that this cereal will keep for years, and it is a reasonable suggestion that a stipulation should be made that all produce shown should be of the current season's growth, otherwise the same bag of oats which might have been reaped in a good season might become a professional prize-winner. We are told that some grains of wheat were found wrapped up with the Egyptian mummies, and that on being planted, after probably 2,000 years, these grains germinated, but a little mild restriction is necessary to promote healthy competition and to discourage anything of the mummy type in our cereal exhibits. I hope this society will take up seriously the question of the establishment in this Division of cattle dipping tanks. The matter has been practically demonstrated to be a great benefit. It is admitted by all that scab in sheep must be eradicated by dipping to make sheep-farming profitable, and why on the same lines should not ticks on cattle and mange on horses be treated with a suitable cure or preventative? The benefit from dipping is not a fad or a theory, but a proven success. Ample data and correspondence on the subject are already before you, and I trust at this meeting some definite steps may be taken to inaugurate dipping tanks in our districts, either by private combination or by this society with the help of the Government. Quoting from the article in the *Agricultural Journal*, by Mr. G. S. Armstrong, M.L.A., he says with reference to his

cattle-dipping tank in the August 21st number:—"I used twenty barrels of cement. Where a man has rough timber for the yards, and can get stone and sand for his concrete at no great expense, he should be able to complete the work, with the few modifications I have suggested, for a sum of between £70 and £100." This brings the dipping tanks within the reach of farmers, as, by a few combining, the expense would be nominal to the members of a syndicate.

At the conclusion of the President's report, the question of the advisability of introducing dipping tanks for cattle was discussed at length, and the general opinion expressed was in favour of

the establishment of these in the Division.

The rather knotty problem of coloured exhibitors was brought up. The meeting was strongly opposed to the competition of Arab exhibitors at the annual show, but not being quite sure of what powers the society had to debar same, the matter was left in the hands of a select committee for fuller enquiry.

A new rule was proposed and carried unanimously, that all produce exhibited must be of the current season's growth, as it was stated that in such classes as oats, samples from extra good years could be held over, under the existing rule, and shown year after year.

Pound Notices.

THE following cattle in the undermentioned Pounds will be sold on the 2nd December, unless previously released:—

Howick.—Grey mare, long tail and mane, about 13.3½, branded CV on hind quarter. Two chestnut colts (geldings), each with four white stockings, stars (large) on foreheads, silver manes and tails. Impounded by Natal Police, Dargle.

Estcourt.—Running on the farm Greenford, and too wild to drive to the Pound, three Kafir sheep as under:—Black ewe, long tail. Black hamel, long tail. Red hamel, long tail. No brands, nicks and slits in ears; also red bull calf, about 6 months old, too poor to be driven to the Pound.

Vryheid.—Dark bay or black gelding, lately clipped, brands very indistinct, looks like NP upside down on near hind quarter (aged).

Highbury.—Running on the farm "Epsom."—Brown Africander yearling ewe sheep, ear mark, hole and notch in right ear.

Richmond.—Black Russian gelding, 14 hands, branded broad arrow on hind quarter, and D over R on off shoulder, two white saddle marks, aged. Has been recently clipped.

Ndwedwe.—Roan gelding, height about 15 hands, branded (looks like) C.L.S. on near fore quarter, shod all round, recently clipped.

Boston.—Black-and-white ox, and red-and-white. No brands visible.

Utrecht.—White gelding, about 15 hands, brand indescribable on near hind quarter, and on off-hind quarter U, good condition, age about 8 years. Bay gelding pony, about 14 hands, branded off-hind quarter JH L (JH joined), mark sore back (wither), fair condition, aged.

Ginginhlovu.—Black ox, about 2 years old, 16 marks or brands. Red-and-white heifer, eighteen months old.

Thornville Junction.—Dun ox, branded P D

on right hip. Black ox, speckled white on shoulders and buttocks, thick wide horns pointing forward and slightly downwards, no visible brand.

Mooi River.—Running on the farm Glen Afton.—Black heifer, white belly, two white patches on back, slit in left ear, swallow tail in point of right ear, no brand visible, about 3 years old.

Dannhauser.—Three goats, no brands.

Eshowe.—Three brown Kafir sheep (ewes).

Eshowe.—One brown Kafir ram, impounded on the 20th September, 1903. The above animal will be sold at the expiry of one month from this date (15th October), if not previously released.

New Germany.—Black-and-white bull, about 2 years, rather poor in condition, probable value, about £3. The above animal will be sold at the expiry of one month from this date (15th October), if not previously released.

Boston.—Young red bull, no brands visible, probable value, £10; impounded October 12th, by J. Jardine. The above animal will be sold at the expiry of one month from this date (15th October), if not previously released.

Howick.—Running on the farm Yarrow.—Black heifer, with white flank and one or two small white patches, small forward horns, about 18 months old, no brands visible.

Dundee.—Dark bay mare, near hind foot white, star on forehead, tip off left ear, mangy, with young foal. Red skimmel mare, with blaze, hind legs white, and off foreleg white, branded near buttock indistinct P.B., has been shod on front feet, white under lip; good condition. Dark bay gelding, off hind foot white, slit in right ear, branded off buttock indistinct N.O.; in poor condition.

Large blue-and-white ox, branded C.V. left buttock, hole in dewlap. Large blue ox, white on flanks and under belly, branded left buttock C.V., outspreading horns. Young black ox, white under belly and legs, slit under left ear and tip off top of right; no brands visible.

Erin, Dronk Vlei.—Dark bay stallion, 3 years old, about 13 hands 3in. high, no brands or marks; probable value, £6. Impounded 22nd October, by Jas. Schofield, Esq., Ixopo. The above animal will be sold at the expiry of one month from this date (23rd October), if not previously released.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C. B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30 with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.
- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.
- No. 66a.—Australian of Scottish parentage, 38 years of age and has been in close touch with farming in Australia. Has had large experience of wattle growing.
- No. 67a.—Welshman, aged 27. Was overseer on a sugar estate in Demerara. Understands the cultivation of sugar, bananas, rice, and certain tropical fruits. Is anxious to acquire local experience, and, if necessary, would be prepared to accept a post, on a month's trial, without pay.
- No. 68a.—Scotchman of 28, well educated; seeks situation on a farm, with light duties; such as overseer, storeman, or tutor. Will give services in return for board and lodging in comfortable home.
- No. 69a.—Englishman, 39 years of age, who has had extensive experience in stock and agricultural farming in South America and New Zealand, is anxious to get on to a large and up-to-date farm in Natal, to acquire local experience. Produces good recommendations.
- No. 70a.—Correspondent writes from Johannesburg that he would like to obtain light employment on a farm for about twelve months. Is prepared to pay a premium, if necessary.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	A. C. Harding ...	Meadow Bank
		"	C. J. Labuscagne ...	Haasfontein
		"	R. Wood ...	Willowford
		"	A. J. Harding ...	Marshlands
		"	J. Snyman ...	Vitzicht
J. Button	Estcourt, South of Bushman's River	"	J. R. Vandermerwe	Welgekosen
		"	B. J. Vandermerwe	Noodhulp
		"	J. Haw ...	Woodleigh
		"	J. Lawrence ...	Grantleigh
		"	W. Fletcher ...	Erina
		"	J. J. Marais ...	Malan Spruit
		"	C. P. Marais ...	"
		"	F. Symons ...	Glenbella
J. J. Hodson ...	Lion's River ...	"	D. Mackay ...	Dalton
		"	U. Cope ...	The Hoek
		"	C. R. Leroux ...	Moras Vlei
		"	P. Ballantyne ...	Bigger
		"	J. C. Boshoff ...	Waterhoek
		"	D. C. McKenzie...	Lion's Bush
		"	R. J. Spiers ...	Owthorn
		"	Jas. King ...	Lyndoch
E. J. B. Hosking ...	Upper Umkomazi	"	P. D. Kimber	Maritzdaal
		"	H. W. Shaw	Talavera
		"	J. W. T. Marwick	Mona Glen
		"	A. H. & E. H. Cockburn ...	Durslade
W. Wilson ...	Polela ...	"	Seyaga ..	"
		"	U. P. Lewis ...	The Hill
		"	C. A. Phipson ...	Strathcampbell
		"	J. Comrie ...	Hepburn
		"	H. Pennefather ...	Home Rule
		"	T. Palframan ...	Watermead
		"	A. C. Thurston ...	The Rocks
		"	J. D. Watson ...	Rainbow
R. Vause ...	Ixopo ...	"	D. C. Arbuckle ...	Kenridge
		"	J. Hayes ...	Glen Gariffe
		"	Leslie Bros. ...	Dunera
		"	S. Maritz ...	Maritzdale
		"	W. H. Walton ...	Greenville
		"	A. E. Keith ...	Norwood
		"	J. Harper ...	Balnahard
		"	A. Knight ...	Highflats
		"	K. Houston ...	The Donga
		"	G. Houston ...	Cloverton
		"	G. Cooper...	Avebury
		"	G. Kippen ...	Kippen's Retreat

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
L. Trenor	Alfred	Scab	Umpapu	Location
		"	Gelatu Duly Um.	Location
		"	banjana ..	Whetherby
		"	R. Mack	
W. Gray	Upper Tugela, South of Tugela River, and Estcourt, North of Bush- man's River ...	Scab	W. P. Gray ...	The Heff
		"	C. M. Pretorius ...	Strydpoort
		"	J. vander Westhuysen	Misgunst
		"		
A. H. Ball	Weenen	"	T. Hair	Gretna Green
		"	S. C. Van Rooyen	Middleburg
		"	C. Van Rooyen ...	Scottsberg
		"	Mrs. P. Lotter ...	Schottspoort
E. Varty	Umvoti, Western Portion	"	J. G. Nel	Elladale
		"	W. F. Marshall ...	Mountain Side
G. N. Perfect	Umvoti, Eastern Portion	"	W. H. Mayne ...	Mistley
		"	Baletshe	Matimatolo
C. J. van Rooyen...	Krantzkop	"	L. J. Nel	Diepfontein
R. J. Raw	Impephle	"	S. Faber	Virginia
		"	H. Hill	Coquidale
		"	Maqundo	Natal Colonization Farm
C. Swales	Umlazi	Lungsickness	P. J. Field	Richmond Farm, near Pitetown
		"	P. W. Department	
		"	Native, Sam Fawkes	Assegai Kraal, near Betha's Hill
A. Hair	P. M. Burg City and Umgeni	Scab	John, & Mr. Kirk Umbabana	Umlazi Location Zwarikop Location
E. G. Clerk	Newcastle	Lungsickness	Dundu	Styl Krantz
		"	S. W. Reynolds ...	Newcastle T. Lands
		Scab	W. A. Laug	Millstone Spruit
		"	J. T. Watson	Bismarck
A. J. Marshall	Dundee	"	S. M'Lief	Greenock
		"	N. B. Surtees ...	Gaustord
		"	Hlubi Gunena ...	"
		"	J. H. Hatting ...	Hattingsvale
		"	P. H. Marshall ...	Cleveland
		"	D. Meumann	Hazeldean
		"	J. A. Landman ...	Boschfontein
		"	Esaw Kumalo ...	Clifton
C. E. Walker	Umsinga	Lungsickness	W. H. Boshoff ...	Pomeroy T. Lands
		Scab	Mlatela	Mazalago
		"	Umshakoma Qutu	Vermaak's Kraal
		"	C. J. de Villiers ...	Vermaak
		"	Umgota Mbata ...	Mumbe
		"	P. R. N. Vermaak	Balgownie
		"	S. J. Vanderwest- huysen	Pomeroy
J. Chaplin	Klip River	"	P. Nicholson ...	Hobsland
		"	W. Leathern ...	Clydesdale
		"	P. K. Dalebout ...	Maggiesdale

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
J. Chaplin ...	Klip River ...	Scab	Stomoko ...	Blauwbank
		"	J. Stomoko ...	Reit Kuil
		"	Botchu Luchaba...	
		"	Umboishwa ...	Vlaakplaats
		"	Thompson and Natives ...	Doornkloof
		"	P. H. de Villiers	Good Hope
		"	J. Bardner ...	Brakwaal
		"	Umveli ...	Stockville
		"	Umkuzanywayo ...	Blauwbank
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	S. Sharratt ...	Klein Waterfall
		"	J. Reed ...	Fairfield
R. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	P. Uys ...	Blood River
		"	M. Gregory ...	Frischegwald
		"	H. Potgieter ...	Rooipoort
		"	— Engelbracht ...	Spitzkop
		Lungsickness	H. Beukes ...	Roodekop
		"	P. H. Nel ...	Blauwatroom
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata ...	
		"	L. Botha ...	Waterval
		"	Ndotyane ...	Rustplaats
		"	Hawse ...	Kromellenbourg
		"	J. B. Steenkamp...	Rustplaats
		"	G. H. Steenkamp	Bloemhoff
		"	W. Pretorius ...	Denny Dalton
		"	Z. de Jager ...	
		"	W. Havermann & Kun	Langfontein
		Lungsickness	O. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Inkunya ...	Tweefontein
		"	Nqume ...	Vredehof
		"	Jonas ...	Bloemendal
		"	J. Coetzee ...	Grootgewacht
C. T. Vaughan ...	Paulpietersburg ...	"	Mcatu ...	Haasfontein
		"	W. Craig ...	Frischegewaagd

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under :—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	1 for Lungsickness	0 for Scab.
" Nkandhla and Ngutu Districts...	...	1	"
" North of White Umfolosi and Umfolosi Rivers	...	—	"
Total	...	2	0

Rinderpest exists at undermentioned places :—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkandhla, and Entonjaneni Districts.
Vryheid District.

Principal Veterinary Surgeon's Office, 28th October, 1903.

M. J. HIME, for P. V. Surgeon.

Government Meteorological Returns.*Meteorological Observations taken at Government Stations for Month of Sept., 1903.*

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).						
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same per'd from July 1st, 1902.	
	Maximum.	Minimum.					Fall.	Day.			
Observatory	75.9	57.2	96.1	48.9	62	7	37	16th	3.63	10.26	
Stanger... ..	76.9	53.4	95	49	75	12	46	3rd	3.44	6.95	
Verulam	77.5	55.7	94	48	37	4	17	9th	2.10	8.02	
Newcastle	75.1	45.1	91	38	23	6	23	14th	.82	4.76	
Estcourt	78.6	45.2	96	32	15	3	15	27th	1.55	3.72	
Umzinto	87.4	55.4	98	50	08	2	66	17th	3.26	7.57	
Richmond	77.2	49.0	101	34	64	5	44	15 h	2.52	4.85	
Maritzburg	79.1	50.6	104	35	60	5	24	17th	1.96	4.77	
Howick... ..	77.1	44.6	98	30	21	6	10	10th	1.87	5.07	
Ladysmith	80.4	45.5	101	34	32	5	12	16th	1.16	...	
Weenen	82.6	44.7	101	32	04	6	04	13th	1.68	3.40	
New Hanover	80.0	50.2	103	35	07	2	07	9th	1.63	...	
Mapumulo	86.1	62.5	108	47	50	2	30	3rd	3.21	...	
N'Kandhla	70.8	40.7	91	35	35	4	10	4 10	2.28	...	
Qudeni	66.0	43.5	87	31	49	12	14	14th	2.84	10.76	
Melmoth	75.0	51.3	102	42	42	5	16	18th	2.05	...	
Eshowe... ..	...	...	99	...	1 12	8	65	4 h	3.73	...
Point ... ..	...	...	...	...	58	6	20	3rd	4.04	6.99
Ndwedwe	75.5	54.0	98	44	62	9	15	18th	2.93	...	
Paulpietersburg	83.5	42.3	96	30	36	4	15	16th	.92	...	
Nqutu	69.6	29.7	89	20	35	6	20	14th	2.50	...	
Mahlabatini	80.2	47.8	102	43	21	4	10	10th	.71	...	
Lower Tugela	81.8	53.3	101	45	1.00	4	60	4th	2.22	...	

District Reports.

NONGOMA, 20th October.—The dry weather still continues, and the country throughout presents a bare and parched appearance. Slight misty rains fell during the month of September on five different dates, giving a total fall of .79 of an inch. This was confined to the higher portions of the district, and was followed, on each occasion, by high drying winds from the North. The rain for last year during the same month totalled 3 inches. Natives are waiting anxiously for the drought to break up. They have most of their fields cultivated, and are ready, on the first appearance of rain, to plant their crops. They reaped practically no grain last season, and the whole population is dependent upon the local storekeepers,

and traders by wagon, for their food supply. The price of mealies keeps at 40s. per muid for American, and 45s. per muid for Colonial samples. The outlook is a very serious one. My Division is free from all cattle disease. Since June, 1902, there have been five distinct outbreaks of rinderpest: four of these were due to infection conveyed by transport oxen, and the fifth to cattle brought into the Division by a Native. In each case the disease was prevented from spreading to any extent. Cattle on the highlands are beginning to suffer from scarcity of grass: those in the thorn country are feeding on trees, and keep in good condition.

A. W. LESLIE, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

To say that the market and trade generally is as "dull as ditch-water," would not be over-drawing the picture now confronting us. The drought still prevails in Natal. It is a source of gratification to read that in the north, east, and west rain to a greater or lesser degree has fallen, and that the drought in certain districts has broken up. At the time of writing, how-

ever, there are at Maritzburg some signs of a change in the elements.

Mealies.—There has been a slight flutter in the grain market during the past fortnight, and prices have firmed a little; but prices in Durban are somewhat in the region of our last report, viz., 14s. 6d. for South American, and 16s. to 18s. for North American.

Forage.—Good dry forage is realising payable prices; unfortunately there is still a quantity of

forage being offered that should not have been baled. Loose forage, from 4s. 7d. to 9s. per 100 lbs.; baled, from 4s. 9d. to 6s. 9d. per 100 lbs.

Hay. There is a demand for good hay and bedding. Hay is now represented by what is commonly called red grass; little or no blue brass hay can be obtained. Hay is realising from 2s. 6d. to 3s. per 100 l. s. Bedding, as usual, depends on size of load.

Potatoes.—Very few local tubers to be found on the market; but what was offered realised from 20s. per 100 lbs and upwards. A quantity of imported potatoes arrived in the Colony this last week, and prices have fallen considerably. There is also a quantity of seed potatoes, chiefly Early Rose and Up-to-Date, at most of the produce dealers'.

Onions.—Fresh Colonial are now coming forward, which has considerably lowered the price. Good samples realising about 6s. to 8s. 3d. per 100 lbs; inferior, 4s. 6d. to 5s. 6d. per 100 lbs.

Green Barley.—Was only represented by a few lots, which sold at 3s. 6d. to 4s. 3d. per lot.

Kafir Corn.—Most of the Kafir corn now selling is imported, and prices are about 20s. per muid.

Poultry.—The market has been fairly stocked during the past fortnight, and good prices have been realised. Common fowls from 1s. 3d. to 4s. 6d. each; ducks have realised up to 10s. 6d. per pair, and Muscovies 9s. per pair; turkeys (cocks) 8s. to 19s. 6d. each, (hens) 7s. 9d. to 8s. 9d. each; guinea fowls, 12s. per brace.

Butter.—There has been a good supply of butter, and prices are consequently much easier. Good fresh butter was sold at 1s. 3d. to 2s. per lb.

Eggs.—Prices are somewhat firmer, but a good quantity changed hands at 1s. 5d., 1s. 9d., and 2s. 1d. per dozen.

Sundries.—Bacon, 8d. per lb.; pork, 4d. to 8d. per lb.; mutton, 7½d. to 1s. 0½d. per lb.; trussed fowls, 2s. 6d. to 4s. 3d. each; sucking pigs, 5s. to 5s. 6d. each; pigeons, 1s. 10d. to 2s. 1d. per pair; rabbits, 1s. 6d. to 1s. 9d. each.

Vegetables.—Beans (broad), beans (French), beetroot, cabbages, carrots, celery, cucumbers, eschalo's, lettuce, leeks, marrows, onions, mushrooms, peas, parsnips, parsley, radishes, rhubarb, tomatoes, and turnips, notwithstanding the drought, are sold in large quantities almost every morning.

Fruit.—Apples (custard), bananas, grenadillas, grapes, lemons, limes, loquats, nartjes, oranges, papaws, pineapples and strawberries find a ready sale at present.

Firewood.—From 7½d. to 1s. per 100 l. s.; cut firewood 10d. to 11d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Great depression prevails in commercial circles, and the pressure exerted by the Banks is extended to all classes of the community. Unfortunately, the outlook is not reassuring, though when things are at their worst they generally mend.

Meat.—There are still large parcels of inferior grain in the market, so that good samples command a ready sale. South American Whites are worth from 14s. 6d. to 15s. per muid,

and North American 17s. 6d. to 18s. The latter will probably drop 1s. per bag on the approach of fresh supplies. The principal demand is for South American, which produce first-class meal.

Potatoes.—Only imported supplies are available, as stocks are low. All good potatoes command 21s. per 150 lbs.

Forage is in big supply with poor demand. Prices rule about 8s. 6d. per 100 lbs.

All other produce generally in slight demand.

JOHANNESBURG.—The depression of trade in general continues, and is affecting every kind of business. The produce market is very low. Goods are not fetching what they cost to land, several dealers having to realise to best advantage to meet their liabilities. Prices are:

Barley (for seed purposes, 163lbs.)—Only a few bags were offered, and none were of very good quality, 16s. to 17s.

Barley (for forage, per 100 bundles).—This still continues to come in largely, and realises 15s. to 22s. 6d.

Bedding (per load).—According to size of vehicle, from 8s. to 35s.

Bran (per 100lb. bags).—This still continues low in price. South American bran, 7s. to 7½. 6d.; for South American wheat bran ground in the Colony, 8s. 6d. to 9s.

Bales of Chaff (per 100lbs).—This was rather well supplied this week, good chaff realising 7s. 6d. to 8s. 3d.

Mabele (per 203lbs.)—Owing to the scarcity of South African corn, that from Bombay must take its place, and prices are firming up owing to shipments having been stopped from Bombay. Whites, 19s. to 20s.; pale red, 21s. 6d. to 22s.; Kurrache red, 23s. to 23s. 6d.

Hay (manua, per 100lbs.)—Very little coming forward, and of very indifferent quality, 6s. to 7s.

Hay (atal, per bale). Also, very little coming forward, and realising rather a better price than my last quotation. 3s. to 3s. 6d.

Hay (sweet grass, per bale).—This continues to come in well, and prices remain firm, 3s. to 4s. 6d., according to size of bales.

Forage (per 100lbs.).—Any amount of forage still coming forward from the Cape Colony, and prices in consequence remain low. 7s. 6d. to 9s.

Lucerne (per bale).—This is also a drug in the market, as at present it is being sold for less than what it can be laid down for. 9s. to 9s. 6d.

Potatoes (per 163lbs.).—Good stocks are in demand. At present, very few good potatoes are coming forward; most are second class in quality. Best, 26s. to 30s.; medium, 22s. to 24s.; inferior, 18s. to 20s.

Onions (per 123lbs).—Prices are on a decline for this line owing to large quantities of imported coming forward. Best, 23s. to 25s.; medium, 18s. to 21s.; inferior, 12s. to 15s.

Eggs (per dozen).—Local new-laid, 3s. 9d. to 4s. 6d.; Colonial imported, 1s. 9d. to 2s.; over-sea imported, 1s. 3d. to 1s. 6d.

Poultry (each).—Fowls, 3s. to 4s. 6d.; ducks, 7s. to 8s.; turkey hens, 12s. to 15s.; turkey cocks, 20s. to 25s.

Slaughter Stock.—Very little business coming forward. Oxen, £22 to £27 l. s.; sheep, 27s. 6d. to 33s.

The Agricultural Journal

AND MINING RECORD.

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Dipping Tanks.

At the present moment the building of dipping tanks is much exercising the minds of cattle-breeders. Such being the case a republication of the leading features of our recent correspondence on the subject may be opportune. Of course, in the construction of these tanks everyone should give his local conditions the fullest consideration. A man who can get sand, rubble, and cement easily should act differently from another to whom these materials would cost heavily in haulage, and who had good stone or bricks close at hand.

MR. G. S. ARMSTRONG, M.L.A.

The communication of Mr. Armstrong had much that was practical and original.

In describing what he believes to be improvements on the Nel's Rust Dip, he gives the fullest recognition of his indebtedness to the example afforded by that Dip, and strongly deprecates the taking of any of his differences in view as criticism. We extract the following:—

"In some respects," he says, "I introduced a few alterations. My gates for the yards I have made sliding ones, like that of the Nel's Rust Dip, between the race and the dipping tank. Such gates are worked more easily in my opinion. Again, in the passage between the tank and the dipping yard I have a small sump or catch-pit. Into this the liquid drains from the dripping yards, and from it there are two 2-in. pipes.

One pipe leads to the bath and is open while dipping is going on, and when dipping is not going on it is stopped, and the other pipe carries off to waste the rain that may fall in the dripping yards. The sump is about eighteen inches across and about three inches deep. I consider this a decided improvement.

"For getting stubborn or timid animals into the bath I use a windlass. It is fixed on the roof uprights over the middle of the bath. A double rope, of length sufficient to go up the race, is fixed to it. At about 18 inches from the loop-end a length of about 2 feet is tied cross-wise to serve as a loin strap. Here you have the essentials of the breeching for a trap horse. When a beast proves refractory this elongated breeching is thrown over him, and a few turns of the windlass brings him into the bath. The short length of rope at the end is for the purpose of hauling back what I may call the breeching when it has done its work. This sketch may assist the description. (See page 566, Vol. VI.)

"Some haul by the horns. Irrespective of other considerations this plan gives more trouble—indeed, the trouble of getting the reim or rope off the horns while the animal is swimming is often not small.

"For boiling the dip I have only one 400 gallon tank; on the top of that tank I have another of 200 gallons for feeding the lower one with water. I also use fire bars in the furnace for improving the draught. The fire bars are old axles and the like.

"In my collecting yard I have the division about the middle; which I prefer.

"If I were building another dipping tank I should dispense with the roof. The roof baulks animals, and is an unnecessary expense. To keep the rain out of the bath and to prevent evaporation I would just cover it, so to say, with a lid made of short lengths of roof iron placed across. This plan, even as regards the rain and heat, would be more effective.

"In making my bath I dug out all the soil, and with planks on the inside built up the walls of concrete. An easier and cheaper way in firm soil would be as follows:—Dig out one wall, making it only

broad enough for a man to work in—say 18 or 20 inches. When dug out, fill up with concrete. Then make the other wall. When both are finished, dig out the soil between, and then you have the bath in the rough. You then, of course, put in the ends and the floor, and cement plaster the whole of the inside. My concrete was one of cement, five of stone, and three of sand. Built in this way no skilled labour is wanted.

"There is another improvement I have thought of, and one which I mean to adopt. I intend putting a balancing flat door at the entrance of the bath. When an animal goes on it, as soon as he gets beyond the balancing point it will drop some twenty inches, and the animal will be plunged into the liquid. It will be on the principle of the doors used in some kinds of rat-traps.

"I used twenty barrels of cement. Where a man has rough timber for the yards and can get stone and sand for his concrete at no great expense, he should be able to complete the work, with the few modifications I have suggested, for a sum between £70 and £100.

"The drop into the tank I approve of, but if I were making another tank, I would not have the comparatively sharp angle where it begins. It should be quite rounded off, so as to do away with any danger of animals hurting themselves behind their hocks."

MR. THOMAS CLARK.

Mr. P. Otto having expressed the views that the drop into the tank might be dispensed with, Mr. Thomas Clark, Howick, wrote:—

"I noticed in one of the last *Agricultural Journals* that Mr. P. Otto says if he were to build another tank, he would not have the 5 feet 6 inch drop. I beg to differ, for both horses and cattle, but especially the former, when they have been three or four times dipped, they get to know what is coming, and they simply slide in without immersing their heads and necks, and sometimes part of their backs. With horses I have always had a boy posted half way along the tank with a bucket of dip to pour on their heads, but all underneath the neck

and jaws never get touched, and more than that, I have another boy with a forked stick to try and push the heads under, but is more than one can do. I consider the tank is not efficient without the drop."

Mr. George D. Alexander also strongly contended against the doing away of the drop.

MR. ALEXANDER H. WALKER.

Mr. Walker describes how he made his kraals to serve as yards for the dip. This opens the question of whether it is advisable to amalgamate the dip and the homestead kraals. He further says:—"I think it would be a great improvement to make the race with a double row of posts, the inner ones 2 feet high, giv-

ing a width of 18 inches, the outer ones giving a width of 3 feet. The outer and inner rails should be connected by a slab sloping against the outer posts. I would also make the slipway into the tank almost semi-circular in section, and only 18 inches wide." This last suggestion is doubtless with the object of preventing animals getting a foothold in resisting the persuasion necessary at times for getting the beasts into the bath.

The points raised in the foregoing have been deliberately stated by thoroughly practical and competent men, and, in consequence, are deserving of the fullest attention by those who have started or who are about to start on the building of a dipping tank.

Passing Notes.

PRODUCE BOXES.—"Agricola" in the *Witness* draws attention to the difficulties and expense connected with the getting of boxes for the sending of small consignments of produce. In this respect the business of the Colony in fruit, etc., is much handicapped, and the matter appears to be one well worthy of the attention of farming associations. In England such boxes are easily and cheaply procurable, not only from case-makers, but from the railways. For instance, from the various stations of the Great Eastern Railway, produce boxes may be obtained at the following rates:—

SIZE.

	In Length.		In Breadth.		In Depth.		Price Each.
No. 1	10½	x	7½	x	3	...	1½d.
No. 2	13	x	9	x	4½	...	2d.
No. 3	15½	x	10½	x	5	...	2½d.
No. 4	16½	x	11½	x	4½	...	3d.
No. 5	18½	x	13	x	6	...	4d.
No. 6	21½	x	14	x	7	...	5d.

What an advantage it would be to the Colony were the Natal Government Railway to supply such boxes at the same prices, plus only the small charge for importation! The cheap boxes having once accomplished their duty, would be held in but little more account than envelopes which had passed through the post. If the project were favourably

entertained, the boxes would presumably be brought by sailing ships, in solidly packed bundles, and on arrival at Durban be hammered together by coolie children. To relieve produce suppliers and produce consumers of the worries connected with "returns," to say nothing of ending the profitless work the railway undertakes in sending boxes back gratuitously to the original consignors, is a consummation worth striving for.

WATERING MILK; AN INDIAN METHOD.—We know of an up-country case of watering milk which took weeks to solve. The supplier, whose farm hands were coolies, was told by the purchaser that his milk was watered, heavily watered and continuously. The supplier was astonished, indignant and angry. Convinced, at last, of the truth of the indictment, he began by personally superintending the milking. The purchaser wrote saying the watering was as bad as ever. The supplier then came to the conclusion that the watering must be done while the milk was in transit. This view coincided with that of Sammy, as we may call him, the head milker. Sammy was most sympathetic, and was eager to help in the sealing of the cans. Still came the news of watered milk from the purchaser to the

bewilderment of the supplier. Accident cleared up the mystery. One day the supplier by chance found before the milking had started that, for a state of emptiness, a can was unduly heavy. Inspection showed that it contained about a sixth of water. Sammy explained that the water had been put into the cans to keep them fresh. The complaints of the purchaser ended.

WATERING MILK; A CHINESE METHOD.—Mr. Oliver Ready, in his amusing book "Life and Sport in China," recently published, reveals the crafty Chinese dairyman's method of watering milk. Mr. Ready tested the milk with a lactometer, and found it contained 50 per cent. of water. He then determined to stand over the man while he milked the cow, and to his amazement the pail contained a large percentage of water. Then he tried milking the cow himself, and got pure milk; whereupon "I seized the dairyman with a hazy idea of making an end of him, when, lo! there slipped from his capacious sleeve a length of bamboo containing about two pints of water. From the lower end of this wooden bottle projected another length of bamboo about the thickness of a cigar, which served as a tube. The culprit, after the first shock to his feelings had abated, showed me with evident, if subdued, satisfaction how this ingenious device worked. Concealing the bamboo bottle, and letting his full long sleeve fall well down over his wrist, he held the end of the bamboo tube and the cow's teat in one hand, so that the moment my eyes were averted he was able to let water flow into the pail together with the milk.

SLEEPING SICKNESS.—A Reuter's telegram of London, November 8, says:—"Colonel Bruce, who has particularly studied the tsetse fly in South Africa, is mainly responsible for the discovery of the Uganda Commission that sleeping sickness is due to the human tsetse fly, 'glossina palpalis.'" The numerous friends in Natal of Colonel Bruce will be well pleased to see that he has acquired for himself further distinction in pathological research. He first made his mark in his investigations of Malta

fever. Then came another opportunity in his commission from Sir Walter Hely-Hutchinson to inquire into the tsetse fly disease. Here again he achieved success, and as a reward received the coveted "F.R.S." In Volume I. will be found a summary of his experiments and discoveries during his interesting investigations of this disease. Later on he was appointed to work in collaboration with Mr. H. Watkins-Pitchford on horse-sickness, but unfortunately, was soon recalled to routine duty by the military authorities.

STOCK THIEVING.—Mr. Frank E. Foxon in his Magistrate's report for Ixopo refers to a matter of supreme interest to stock farmers. The matter deals with the stock thieving Laws. A native, Mboza, in the high position of an Acting Chief, was charged, and was convicted, of stock thieving at the local Magistracy some years ago, and was sentenced to two years' hard labour and 25 lashes. Acting Chief Mboza did not learn by this lesson to turn over a new leaf. He has been stock stealing again, and despite records, and presumably every kind of evidence, including, it may be assumed, the scars on his own back, he has been treated by the Native High Court as a First Offender. This miscarriage of justice is apparently due to the neglect of the Prosecutor of the Native High Court, but how the neglect can warrant the closing of the eyes to the boldly outstanding and unimpeachable fact that he had been previously convicted of the same crime must be a mystery to laymen. Such miscarriages of justice, justice as intended to be meted out by the Legislature, must be disheartening to those engaged in the detection and repression of crime, and exasperating in no small degree to those in the possession of stock.

C. O. D.—This system of sale is now in operation on the railway. Elsewhere will be found the advertisement. At the present moment, owing to the drought, small farm produce is scarce, but there is, of course, some for sale. To those who wish to effect sales by this system, we would suggest the advisability of advertising on the following lines.

The advertisement should, we think, start with the letters C. O. D. They count as one word only; they are self-explanatory, and catch the eye. Advertising, at any rate for a time, is essential. The cheap columns of the newspapers would be suitable, and quotations for 2, 3 or 4 insertions per week or month should be obtained, a draft of the advertisement being submitted. Here are a couple of examples:—

C. O. D.—Butter, 1s. 10d.; mutton, 8d. and legs 10d. per lb.; dressed poultry, 1s. 2d. per lb.; eggs, 2s.; cabbages, 4d. T. Atkins, Thornville Junction.

C. O. D.—Eggs, 1s. 9d.; butter, 2s.; peas, 1s.; bouquets, 1s. cream cheese, 1s.; Belgium hares (dressed), 9d. per lb. John Tarr, Rosetta.

The prices should, of course, be moderate, for it must be borne in mind that payment is practically certain, and that the work ends with the delivery of the goods to the railway. The quality must also, of course, be good. If the vendor sends really fair value, he will quickly get a reputation that will enable him to dispose of advantageously, in this easy way of doing business, what he may have for sale. A satisfied customer is the best advertisement.

Boone County Maize.

THE Department of Agriculture has just imported from the United States 75 bags of a new variety of maize, Boone County White, which is said to be equal to Hickory King maize, and is now offering it for sale at the rate of 22s. 7d. per bag on rail at Cedar. Farmers desirous of giving this maize a trial should

forward their applications without delay to the undersigned.

A. N. PEARSON,
Director of Agriculture.

Department of Agriculture,
Pietermaritzburg,
4th November, 1903.

Ticks and African Coast Fever.

By CHAS. P. LOUNSBURY, in the *Transvaal Agricultural Journal*,
Government Entomologist of Cape Colony.

FOR the purpose of obtaining material and data to assist in elucidating the relationship that exists between ticks and African Coast Fever, the writer has visited the infected area of the Transvaal during March and April last. Because of its interest to the Cape, in common with the other Colonies, the subject of the natural transmission of the disease already had had my attention at Capetown for a number of months, and it was considered that observations on the infected ground would materially aid in the solution of obscure points. The trip lasted four weeks, and then it had to be brought to a close in order that the experiments in progress in Capetown might not be interrupted. Most of the time was spent in the company of Dr. A. Thiel, the Veterinary Bacteriologist of the Transvaal, and to him I am indebted deeply for hearty co-operation and numerous courtesies. A more extended visit would have been more satisfactory, but, as far as could be told at the time the principal objects had been achieved, inasmuch as considerable material

in the form of ticks* of various species from diseased animals was secured, and observations made on the habits of these. Many months must elapse before all of the material can be utilised in experiments, as tick rearing and testing is a slow process. Three or four months in the winter are required to naturally hatch the eggs of the species which most quickly develop, and almost as long again is needed to rear most of even these on cattle.

Meanwhile, a report on what of interest was learned during the trip is desired by the Transvaal Government, at whose request and expense it was made. Hence has been prepared this paper, in which, to give it value is incorporated a record of the results of the studies to date, and other matter appertaining to ticks that has a practical bearing on the subject.

DIFFERENTIATION OF AFRICAN COAST FEVER FROM REDWATER.

The disease in question is herein discussed under the name "African Coast Fever," the

designation recently proposed by Dr. Koch to distinguish it from ordinary Redwater. Heretofore it has been variously known as "Rhodesian Cattle Disease," "Rhodesian Tick Fever," "Rhodesian Redwater," "Virulent Redwater," &c.

When African Coast Fever appeared in Rhodesia over a year ago it was classed by investigators as Redwater. So the Chief Veterinary Surgeon of Rhodesia (Mr. C. E. Gray) and the Bacteriologist of the Cape Agricultural Department (Mr. W. Robertson) call it in their joint report, dated August, 1902. Almost from the first, however, certain differences from Redwater as previously known in South Africa were observed in the lesions produced, and in the form of the intracorpuseular organisms seen in the blood. These differences were pointed out by Gray and Robertson in their report. Various factors were suggested as the cause of them, such as the high altitude of Rhodesia and intensification of the virulence of the disease by its passage through a large number of highly susceptible animals.

The two diseases are still considered closely related, but it is highly probable that they would have been differentiated at the outset, or very soon afterwards, despite their close association, were it not that Dr. R. Koch, in a report on cattle troubles in German East Africa, made in 1897, had previously confounded them. Dr. Koch at that time described the organism associated with African Coast Fever, and unqualifiedly considered the disease occasioned by them identical with Texas Fever—that is Redwater. His error was very naturally perpetuated by those who studied the disease in Rhodesia, no one presuming to question the correctness of the diagnosis by so eminent an authority.

It is probable, too, that both diseases were present in the same herds at the same time in the early Rhodesian outbreaks, and that since the epizootic has consisted almost exclusively of African Coast Fever. Within three months of his signing the report with Mr. Robertson that the epizootic was only a very severe type of Redwater, Mr. Gray, in letters written to Mr. Robertson and to me, was gravely questioning the conclusions that had been reached, the admixture with Redwater having become less.

From Dr. Koch's German East Africa report, it seems very probable that the two diseases existed coincidentally about Dar-es-Salaam in 1897 amongst cattle recently brought to the coast, just as it appears to have done in Rhodesia. Dr. Koch describes what are unmistakably the lesions of Redwater, and then, going on to speak of the microscopical examination of the blood, he dwells at length on the organisms now considered peculiar to African Coast Fever.

That the Rhodesian disease was quite different to Redwater was at once strongly suspected in Capetown when a case produced by ticks, in December, 1902, yielded post-

mortem lesions dissimilar to those of Redwater, but identical with those found in what had become to be considered the typical Rhodesian disease, and when the examination of the blood disclosed only the new organisms. There was no longer any high altitude to offer as an explanation of differences, and the duration of the incubation period and prolonged course of fever precluded the idea of extreme virulence. Evidence that the disease was not Redwater was meanwhile accruing in Rhodesia, and also in the Transvaal. Redwater has long been known in the latter Colony, and when the new disease appeared, Dr. Theiler was at once able to distinguish between the two by microscopical examination of blood smears. Moreover, early in the present year he demonstrated by exposing cattle on infected veld at Nelspruit that a very high degree of immunity against Redwater gave no protection whatever against the new disease, and, what was still more significant, that the inoculation of even large quantities of virulent blood into susceptible animals was followed by no perceptible reaction. Dr. D. Hutcheon, the Chief Veterinary Surgeon of the Cape, was called to investigate the Transvaal outbreaks, and in his report, written about March 1st, while discussing the disease as "a severe and altered form of Redwater," he shows that it is so distinct in its behaviour that it must be treated essentially as a new disease, and he makes suggestions for the prevention of its spread in accordance with this idea. Altogether, therefore, the way was well paved for Dr. Koch, in his first report (about April 1st), to reverse his East African conclusion by definitely stating that Redwater and the new disease are specifically distinct.

AFRICAN COAST DISEASE EVIDENTLY A TICK-TRANSMITTED AFFECTION.

That the disease responsible for the epizootic in Rhodesia was transmitted by ticks was undoubted by the Rhodesian Veterinary Staff even before the official diagnosis as Redwater was made. The way in which it attacked one animal here and one there in a herd, often sparing for the time those in immediate contact with sick and dying beasts, the way it died out in a herd only to appear again with greater violence after a few weeks, and the way it appeared along the main traffic routes after a lapse of weeks from the passing of infected spans of oxen, all suggested the agency of ticks as an intermediary, these parasites being not uncommon in the country, and it being known that other diseases which occurred and spread in a like sporadic manner were thus transmitted.

The primary object in first attempting to transmit the disease by means of ticks under observation was to afford a conclusive demonstration that would lessen the opposition to measures undertaken or urged for the suppression of these carriers of the disease.

Because of my investigations into the transmission of other diseases through the medium of ticks, the work naturally drifted into my hands at Capetown; and, moreover, it was highly desirable that the demonstration be made out of the infected area, and where no Redwater occurred. For the purpose of testing the question of their pathogenicity, various lots of ticks taken from diseased animals were sent to me by Mr. Gray and his assistants during the latter half of 1902, and during the early part of the present year. Owing to the assumption that the disease was a highly virulent form of ordinary Redwater, the presumed transmitter of this disease—the common blue tick (*Rhipicephalus* (*Boophilus*) *decoloratus*) was made the basis of the early tests, and experiment after experiment with the progeny of adults from sick cattle were made without any symptom of fever being produced.

PROOF THAT AFRICAN COAST FEVER IS TICK-TRANSMITTED.

Later, quite a distinct species of tick was given a test, and on two cases of the disease produced by this species under observation at Capetown rests entirely, I believe, the direct proof of tick-transmission. It chanced that amongst the specimens of ticks sent in two lots from Salisbury in early October were a few engorged nymphs of a species of *Rhipicephalus*, which for the present will be designated simply "brown tick." A "nymph" tick, it may be explained, is one in its middle stage of life. When a tick emerges from the egg, it is a "larva"; when it casts off its skin, which it does after having once engorged itself on blood, it is a "nymph"; and when it casts off its nymphal skin after a second engorgement, it is an "adult," and ready for a final feeding. The brown tick nymphs mentioned shed their skins in due course, and to the number of seven--five females and two males--were placed under a bandage on the leg of a young locally bred ox, November 27th. They were small creatures, only about one-eighth of an inch long, and it was consequently difficult to keep track of them in the rough hair. Three of the females were found dead in the wrappings on the next day, and altogether only three--the two males and one of the females--were found attached to the skin during the days that followed. "On December 12th, fifteen days after the ticks were applied, the ox came into fever," and during the night of the 28th it died. The course of the fever was that now known, thanks to the records of Dr. Theiler's Nelspruit experiments, to be typical of African Coast Fever. The post-mortem examination was held by Dr. Hutcheon and Mr. Robertson, both of whom were well acquainted with the disease from experience with it in Rhodesia, and they were perfectly agreed that the lesions were those of the new complaint. The es-

sential features of an ordinary Redwater post-mortem were absent, and the urine was clear, whilst the striking characteristics of African Coast Fever, oedematous lungs and infarct-spotted kidneys were pronounced. Mr. Robertson examined smears of the blood during the fever period, and found the so-called "bacillary" organisms of Redwater. The allusion to Dr. Hutcheon and Mr. Robertson here gives me an opportunity to acknowledge that in all the tick-transmission of disease experiments, I am indebted to them for much assistance in their respective subjects of veterinary science and bacteriology, and that without such co-operation the work would have far less value, and would not command the respect of scientists.

The other case of African Coast Fever under observation was also produced through the brown tick. The specimens used were taken as adults from diseased animals. It so chanced that when an animal dies the brown tick, unlike some other kinds, soon loses its hold and crawls away. Advantage was taken of this habit to secure a large number from oxen which died at Nelspruit when I was there with Dr. Theiler. The ticks were sent to Capetown, and, as received in three lots, were applied April 1st, 8th, and 11th to a healthy heifer susceptible both to Redwater and African Coast Fever. It was presumed that some of them were pathogenic, though not necessarily from feeding on the animals from which they were taken. The heifer came into fever April 22nd, 21 days from the first application, 14 from the second, and 11 from the third. Probably it was a specimen or specimens from the second or third lot that transmitted the infection. The fever followed the course typical of African Coast Fever, and terminated in the death of the animal on the night of May 7th. Smears of blood were examined during the febrile period and after death by Mr. Robertson, and only organisms of the bacillary and spherical forms observed; these occurred sparingly. The post-mortem examination was conducted by Mr. Robertson, and most of the lesions of African Coast Fever found.

Thus the direct evidence is good that the disease is transmitted by ticks. It should be observed, however, that there is no proof that the infection was derived from the animals off which the ticks were taken in either of the two cases; the significance of this remark will be apparent later.

Dr. Koch makes the statement in his first Rhodesian report that he transmitted African Coast Fever from a diseased to susceptible animals in German East Africa by using the progeny of a tick closely allied to the blue tick (*Rhipicephalus* (*Boophilus*) *decoloratus*) and *Rhipicephalus* (*Boophilus*) *annulatus*. But a perusal of his original report in the light of more recent knowledge leaves it very clear that he is mistaken. The disease he transmitted was evidently not African

Coast Fever, but Redwater, and that of an exceptionally mild strain.

TRANSMISSION OF DISEASE BY INSECTS AND TICKS.

Our exact knowledge of the transmission of the disease by insects and ticks has nearly all been acquired during the last fifteen years, and is yet very far from complete, even with regard to the cases which have been most studied. Leaving aside disease such as enteric fever and cholera, the infection of which may be carried by insects to food and drink, and all others in which the transmission is simply by the mechanical carriage of the disease organisms, there are left many diseases with which the transmitting carriers are so very intimately associated that they are apparently absolutely indispensable. The skill and patience of an Englishman first unfolded to the world the wonderful life story of malarial organisms. He found that when a certain kind of mosquito (*Culex pipiens*) gorged itself on a bird infected with a fever distantly akin to the malaria of man, the organisms of the disease continued to develop in its stomach, and finally form "sporozoites" which lodged in the salivary glands ready to be discharged into the blood of a later victim to the insect's appetite. Italian investigations affirmed the observations, and soon demonstrated that the organisms of human malaria developed similarly in certain other mosquitoes (*Anopheles*.) They proved that infected mos-

quitoes communicated the disease to men, and then, by a series of elaborate and exhaustive studies and experiments of the most convincing nature, they showed that men did not contract malaria either through drinking the water or breathing the air of the most foully malarial places. Yellow fever, it has been discovered by an American, is transmitted by a mosquito (*Stegomyia fasciata*), and all the evidence appears to show that the disease is disseminated solely by this agency. The organism of yellow fever has not been discovered; but that it undergoes a development in its mosquito host is indicated by the fact that a mosquito cannot transmit the disease until ten days or more have elapsed from the time it became infected. It should be observed that although these various diseases are all transmitted by mosquitoes, they are not transmitted by mosquitoes of the same kinds. Italian investigators have carefully experimented with many kinds of mosquitoes, and also with a number of different sorts of other blood-sucking insects, and have reported them all innocent of carrying human malaria, except those of the genus *Anopheles*.

The investigations into the transmission of diseases by ticks have not been fully carried out, as those relating to the transmission of the malarial diseases of man and birds, but they bear more intimately on what I am leading to, namely, the importance of ascertaining by just what ticks African Coast Fever is transmitted.

(To be Continued.)

The Hon. H. D. Winter.

IN the *Gazette* of the 10th inst. it was notified that His Majesty the King has been pleased to approve of the title of "Honourable" being retained by Mr. H. D. Winter, who for more than three years was a member of the Executive Council of Natal.

Mr. Winter took office as Minister of Agriculture on the 16th February 1899, and vacated office on the formation of the present Ministry (Prime Minister Hon. G. M. Sutton, M.L.C.)

The following gentlemen have held office as Minister of Agriculture since the establishment of the Department:—

Hon. Edward Ryley, 15th February, 1897.

Hon. Sir Henry Binns, 5th October, 1897.

Hon. F. A. R. Johnstone, 22nd Oct., 1897.

Hon. H. D. Winter, 16th February, 1899.

Hon. W. F. Clayton, 18th August, 1903.

Previous to the 15th February, 1897, the Agricultural Department was under the Ministerial control of the Treasurer (the Hon. G. M. Sutton).

TICKS AND AFRICAN COAST FEVER.—

Just before going to press we received *The Transvaal Agricultural Journal* for October, containing a most interesting article from the pen of Mr. Lounsbury, Entomologist to the Cape Government, on the relation of ticks to the South African Coast Fever. We are able in the present number to reproduce about half of the article; the remaining portion will appear in the next issue.

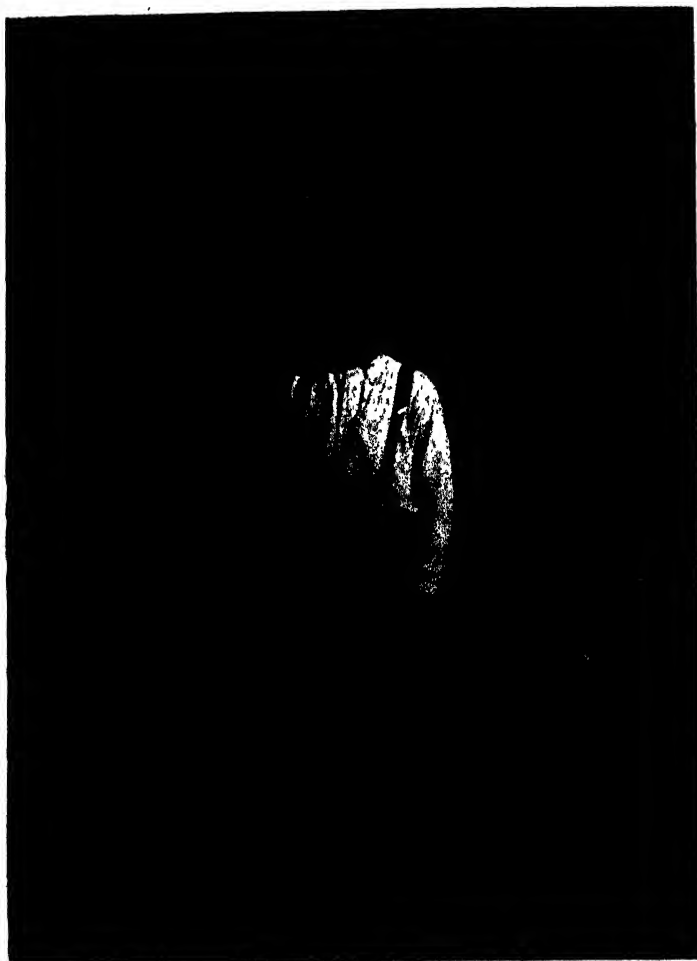


Photo by Editor.]

SUGAR CANE FODDER.

Mr. John Moon's Farm.

(See Article.)

Sugar Cane Fodder.

(See Illustration.)

THE following, which is extracted from the interview of Ergates with Mr. John Moon, of Manderston, describes the illustration of sugar cane used for fodder. About sugar cane as winter fodder Mr. Moon is enthusiastic :—

“From that piece of land of only one-and-a-quarter acres,” he observed, “I shall get about 150 tons of first-class winter food for all stock. I intend to go in for sugar cane largely. It is going to be the winter food for this district in the future. There is nothing in the way of winter food so easy to grow. I put that little lot in over there, of just one-quarter of an acre, five years ago. Six months ago it was cut to the roots, and now, as you see, it is 7 feet high. Since

it was planted it has had one top dressing of kraal manure. During the summer I feed it to my horses—which work all the year round—and to the pigs.”

“Does it give horses diarrhoea?”

“No. Indeed it acts slightly in the opposite direction, and sometimes I have to throw a handful of salts on their feed.”

“Do the salts not choke the horses off their feed?”

“Nothing can keep a horse off cane.”

“How do you feed it to your horses?”

“It is put through a chaff-cutter with one blade off, and mixed as it goes through the machine with about a third of hay and a third forage.”

White Ants in Orchards, Plantations, and Fields.

SEVERAL inquiries have been made recently about the best means of preventing the destruction of trees in orchards and plantations by white ants. Amongst others, a letter was addressed by Mr. Pepworth to the Conservator of Forests, and to this the Director of Agriculture has written a reply which in substance was as follows :—

W. Pepworth, Esq., M.L.A.

SIR,—Your letter of the 7th inst., addressed to the Conservator of Forests, and inquiring about the protection of young trees from white ants, has been referred to the Entomologist, and I have now the honour to reply to your inquiries.

The methods of coping with white ants may be considered under three heads, as follows :—

1st. Clearing out the ants before planting the trees.

2nd. Killing the ants after planting the trees.

3rd. Making the young trees distasteful to the ants.

Clearing out the Ants before Planting the Trees.—Of the above-mentioned three methods, the first may be regarded as fundamentally the best. If poisoned food were distributed over the ground some time before planting it is reasonable to suppose that practically all the white ants would be destroyed. In those districts of India where the white ants attack the crops, the cultivators make balls of flour or other grain, mixed with arsenic, and place them in the fields. This poisoned food is eaten by the ants which first find it, and these ants when dead are eaten by their fellows, so that the poison is spread through the nests. Poisoned food is also conveyed by the working ants to the queens. In Natal the Government Entomologist recommends the use of arsenical solution of sugar or molasses, (1 lb. of arsenic and $\frac{1}{2}$ lb. washing soda dissolved in 16 gallons water, then add

6-8 lb. coarse sugar or 4-5 lb. treacle), the same as is used for locust destruction. Mealie meal may be soaked in this and made into balls or cakes for distribution. These should be distributed over the ground, and may with advantage be covered with boards, sacks, or even stones or earth. Sawdust may be used instead of mealie meal; or old sacks themselves may be dipped into the poisoned molasses, and used without the poisoned meal. Mr. Fuller, the Government Entomologist, recommends that holes 2 or 3 feet deep be made by a crowbar, and filled up with sawdust or meal soaked in the sweetened arsenical solution. The poisoned food should be laid about until all traces of ants disappear. The ground may then be regarded as practically cleared.

This work of destruction may be assisted by the use of *bi-sulphide of carbon* introduced into the ants' nests. A hole may be bored by means of a fencing bar or crowbar to the centre of a nest, a length of pipe placed in this hole, a funnel placed in the top of this pipe, and 4 or 5 oz. of bi-sulphide of carbon poured down. The pipe should then be withdrawn, and the hole plugged up. The bi-sulphide, being volatile, will diffuse throughout the nest, and its poisonous vapour will kill the ants.

Killing Ants after Trees are Planted.—

When young trees are found to be attacked by white ants, then the ants may be poisoned either with the arsenic mixture as above described, or by means of bi-sulphide of carbon poured into holes around the trees. In using poisoned food, the material should be laid down here and there near to the trees, and covered over with boards, sacks, stones or earth. In using the bi-sulphide, two or three holes may be made about 12' or 15 inches away from the tree, and 12 or 18 inches deep; and half an ounce of bi-sulphide may be poured down each hole by means of a pipe, and the holes immediately stopped up.

Mr. Fuller suggests that young trees when planted out might be surrounded by a ring of poisoned sawdust, put into a shallow trench about 12 inches from the tree, the poisoned sawdust consisting

of 50 lbs. sawdust and 1 lb. arsenic made into a mush with treacle and a little water.

Making the Trees distasteful to the Ants.—In some of the cane-growing districts of India, where the seed cane is apt to be eaten by white ants, the cultivators (according to Watt's Dictionary of Economic Products) dip the ends of the seed cane in a liquid prepared with asafoetida, mustard oil cake, and putrid fish, etc. According to the same authority, a Mr. Wray strongly recommended the use of petroleum, to the vapour of which white ants are said to have a strong antipathy, so much so, that if the ends of the seed canes be dipped in water impregnated with petroleum, the white ants will not come near them. This method of protecting young trees appears well worth trial. Various kinds of dips might be employed for experiment. Kerosene suggests itself as the petroleum to use, though a more volatile oil, such as gasolene, might perhaps be more suitable. A little of the water impregnated with the petroleum might also as an experiment be poured down the holes before planting the tree.

I shall be glad to hear from you as to the results of any experiments you may make. I hope to have some Departmental tests made shortly.

I have the honour to be,

Sir,

Your obedient servant,

A. N. PEARSON,
Director of Agriculture.

Lambing suggests docking, and it is as well to give a few points on the method, for everyone is not expert at the work. The operator needs an assistant, who adopts a sitting position, holds the lamb with its back to his breast and its butt on his knees, with the two legs of each side in each hand. The operator then takes the tail by its butt, presses the skin towards the backbone, and snips it off two inches from the body with a pair of pruning shears. It is done instantly, and when the lambs are only a few days old, but little blood is lost, and the risk is trifling.—S. F. & D.

Protection against Snakes.

SNAKE SERUM.

THE Government Bacteriologist, Mr. H. Watkins-Pitchford, F.R.C.V.S., reports that he has a protective and curative preparation for use in case of snake-bite available for issue to the public. He writes:—

This preparation has been elaborated from the South African venoms only, both viperine and colubrine (of which the Puff Adder and Black Mamba are perhaps the chief examples as far as Natal is concerned). It is hoped, therefore, that this preparation may be instrumental in saving both human and animal life, and in assisting recovery of non-fatal cases of snake-bite. As far as I am aware, this is the first preparation in which an attempt has been made to secure a preparation equally anti-toxic for the different classes of snake-venoms. While it will keep fit for use for an unlimited time provided the cork is not withdrawn

—being germ-free, and containing no antiseptic or preservative—it is nevertheless advisable to secure a fresh supply from time to time, as a certain degree of deterioration of its anti-toxic properties ensues with age.

I am endeavouring to get a syringe, made in Europe at the present time, which, capable of acting as the injecting syringe, is at the same time the containing bottle itself. This, I hope, will render the preparation more portable and available, and free from the difficulties and loss of time attending the usual hypodermic injection apparatus.

Full directions for use accompany each issue, and I trust that those under whose notice an application of the remedy comes will be good enough to communicate with me fully as to the result of the case and the details attending the use of the preparation. The price per dose is 5s.

Natal Government Railways.

COLLECT ON DELIVERY SYSTEM.

THE Department has adopted what is known as the Collect on Delivery System, and it will be brought into force from date, applicable in Local Traffic, and Through Traffic with the Central South African Railways.

The system is briefly this:—The Railway Department collects from the consignees the declared value of consignments (other than live stock) on delivery of same on behalf of the sender, the receiving station remitting the amount through the sending station to sender.

The rates of commission for collecting from consignees on behalf of sender the amount recoverable in respect of the value of the consignments are, viz.:—

Not over £1 3d.

Not over £2 4d.

Not over £5 6d.

Each additional £ or part thereof 1d.
Maximum £100.

These rates are payable, even though the collection of value is not effected, to recompense the Railway Department for services, which, though ineffectual, will exceed those rendered if the consignment were delivered in the first instance.

A sender wishing to take advantage of the "Collect on Delivery System" will hand the package fully and legibly addressed, which he wishes forwarded, to the officer at the sending station appointed to receive the same, together

with a Consignment Note, which in addition to the usual particulars, must show the amount to be collected from the consignee for and in respect of such package irrespective of railway freight, any special instructions regarding the delivery, etc., he desires carried out, together with an account giving detail of contents of package or packages. Further information in regard to ar-

rangements can be had from the Station Masters at any station on the Natal Government Railways.

DAVID HUNTER,
General Manager.

Office of the General Manager,
Durban,
19th October, 1903.

Correspondence.

To the Editor *Agricultural Journal*.

ARROW-ROOT REMINISCENCES.

SIR,—In your very interesting *Journal* of June last, with a copy of which I have been favoured, I notice a very neat article, entitled "A Chat with Mr. J. J. Medley Wood, A.L.S." In the article is an allusion to my having grown arrow-root, and also a statement that the late Mr. Thomas Reynolds was the first to produce it in quantity. To these statements I demur, and am sure my good old friend of more than 50 years' standing will not object to my sending you my version, which is this. Mr. McKen, Mr. Wood's predecessor at the Botanic Gardens, gave the late Major G. Adams some tubers of arrow-root. These were planted. At this time I was working in partnership with Mr. Adams at the great Umhlanga. The tubers grew splendidly, and the next year we had a large crop, but as we had no means of grinding it, we sold the roots at 4s. 2d. per 100 lbs. to many customers, reserving enough for ourselves which we divided, as I had bought land at the mouth of the Umhloiti. There I grew arrow-root very successfully, and by taking the precaution of always examining my produce with the microscope I had the pleasure of selling it year by year to Messrs. Palmer & Blackwood, Durban, at 6d. per lb. I left Natal in 1859, and that year I sold it to the same firm at 3d. per lb. and half profits on the sale in England. This was not a success, as the samples arrived damaged, and just

met all the expenses. The real reason why the price fell was that growers would not take sufficient trouble in making it. The colour was as a rule bad, and the sand and grit spoiled the sample. Some which I sent home in tins, which, by the way, George Adams soldered up for me, fetched 10d. per lb. in Mark Lane.

I have always thought that I grew the largest quantity of arrow-root in my time. I may be mistaken, but I had from 10 to 12 acres, and I never saw any plantation as large as my own; but of this I am certain, Mr. J. Reynolds was not the first to produce it in quantity.

The following story regarding one of the early growers would, I think, be interesting:—

He went into Durban with a load and stopped at a well known merchant's store, where a dialogue something like this took place:—Merchant—"Hullo, what have you got to-day?" Planter—"Something you've never seen before. Do you know what it is?" Merchant—"Why! it's arrow-root; what do you want for it?" A good deal of bargaining went on (there always *did* at that particular store), which resulted in the merchant giving a cheque for the sample, I think at 4d. per lb. A day or two after he sent to the seller for the return of his money, as he had discovered that what he had bought was not arrow-root at all, but

potato starch! The seller indignantly refused to refund, on the ground that he never said it was arrow-root, and did not sell it for such. The merchant had over-reached himself, and we all laughed our fill at the joke, for such we called it. That merchant had got the better of many a seller, and this time had suc-

ceeded in besting himself. I hope you will pardon an old man's reminiscences, but what I have said has many a time been a source of amusement to me.

I am etc.,

F. CLAYTON.

The Elms,
Morden, Surrey.

Butter Samples.

SAMPLES OF BUTTER FROM "NOVICE."

THIS sample from "Novice" reached my office in good condition, and I have scored it as follows:—Flavour, 44; colour, 5; grain and texture, 24; dryness, 9; style and neatness, 9. Total, 91. This was a very good sample of butter, the grain and texture being exceptionally good. The flavour was not quite correct, the cream having evidently been over-ripe at the time of churning, although this is a fault somewhat difficult to obviate, considering the hot weather we have been having of late. I should advise "Novice" to put a handful of salt in his cream after each separation, and to well stir it in, also to be sure

and cool his cream down immediately after separating. This can be accomplished by using a cream aerator, but probably "Novice" has not one in use, so the next best thing to do is to stand the cream bucket in the coldest water obtainable, changing the water occasionally until the cream has reached the temperature of the water used. "Novice" neglected to send his name and address, which is necessary; and in future those who send samples must give their names and addresses, not for publication, but as a guarantee of good faith.—E. O. CHALLIS.

A Great Poultry Farm.

SAID TO BE LARGEST OF ITS KIND IN THE WORLD.

IN Shelby County, Ohio, is situated the largest chicken and egg plant in the world. It is further distinguished from all other poultry houses in five ways—first, it produces for the market only, caring nothing for fancy breeds or other side lines; second, it is operated on an absolute system; third, it never loses a chicken by disease; fourth, it produces unfertile eggs; fifth, and most important, it is based on "kindness."

The daily output is 200 dozen unfertile eggs, which sell at an advance of 15 cents over the market price, never less than 30 cents.; and 330 one-and-one-half-pound broilers or one-half-pound "squab," both unequalled for tenderness, quality, and flavour. There is no direct competition, business is on a strictly cash-in-advance basis, the demand is

constant the year round, and the system is perfect.

How is it all done? The owner must be an old hand, wise in poultry lore. On the contrary, his venture is only a few years old, and he says that he doesn't know anything about the chicken business—that the only thing he goes by is plain, everyday common sense. The inference is that he must have a good deal of it.

THE HATCHERY.

The plant divides into two separate industries—one producing chickens, the other unfertile eggs. Let us follow the former from the beginning. In a building by itself are 900 Plymouth Rock hens in sixty pens, fifteen to a pen, one rooster to fifteen hens. They are selected, not

according to points, but for health and strength only. To avoid favouritism, the roosters are changed once a week. The hens lay all the year through, this being accomplished by watching their diet. The body heat of a hen must be 103 degrees before she can hatch or wants to sit. This high temperature is caused by fever, and if the fever is prevented the hen will continue to lay and not get "broody." At the first sign of it (it does not happen often), the hen is changed from corn to a less heating diet in small quantities, and at night is kept in the damp yard that opens off every pen. This "cools her off," and she begins laying once more. So, when the feed cart goes down the long aisle between the two rows of pens it returns laden with fresh eggs.

These eggs are taken to a room in the basement of the main building, which contains 30 30-day incubators of 300-egg capacity each. Two incubators are started one day, one the next, so that every day would average 450 chicks if all hatched. Very few fail. At the end of seven days a lamp test is made, and unpromising eggs taken out and sold to local bakers. Seven days later another test is taken. After hatching, the chicks are left in the machines one day, for their systems to dry out.

THE NURSERY.

A year-round average of 330 chicks goes up every day in a little elevator to the "nursery." Here is a horseshoe of 30 pens, gradually increasing in size. The chicken never spends two days in the same pen, but throughout the entire system moves up one pen every day, the entire change requiring only 15 minutes. Thus the system is on a most exact arithmetical foundation.

During the first 36 hours in the "nursery" the chicks receive no food. The floors of the first seven pens are covered with removable cloth, and there is no sand that the chicks can pick up and so injure their tender organs. The proprietor explains that the chicken "has no sense," and, not having food, would pick up the sand. So until they have been half a day in pen No. 2 they do nothing but run around and dry out some more. The first food is a bare pinch of finely-ground corn placed on a

board. The chicks learn to go to the board for food, and it is always found there and nowhere else. Thus no food is wasted and the amount used is known exactly. At pen No. 8 the cloth is replaced by sand on the boards. Water is furnished from a self-feeding can with a narrow trough around it. Gentle heat comes from hot water pipes a foot or so from the floor over one end of the pen, the distance from the floor being increased every ten pens. The ground corn diet is increased gradually from pen to pen until when they reach pen No. 30 a handful is given three times a day for the entire brood.

On the thirty-first day of their lives the chicks are transferred from the "nursery" to the "horseshoe," a similar but far larger building, under the same roof, 840 feet in length, the end of it being right across the driveway from the starting point. The pens are 60 in number, larger, and each opens into an outdoor yard. On the theory that a chick when cold will crouch on the ground, expecting heat from above, "mothers" are provided. In each pen is a large metal disc, which reflects down the heat from two natural gas burners under it, the discs becoming higher from the ground in every pen. This keeps the temperature at about 65 degrees, 15 degrees lower than in the "nursery." Supplementary heat can be furnished from steam pipes, and ventilation is afforded by cold air ducts every 37 feet. The population of the "horseshoe" averages 21,000, that of the "nursery" 9,000, making a total of 30,000 chicks of all ages.

Until they are half-way around the "horseshoe"—60 days old—the chicks are never allowed to roost, so that they rest on the ground, and gain in shape and fullness of breast. When 60 days old they weigh one half-pound, and many are then sold to fashionable hotels as "squabs," never bringing less than 5 dols. a dozen. At pen No. 70 cement floors begin, and the diet, hitherto designed to give only health and strength, is changed from ground corn to mash in order to produce weight and bulk. At the end they are 90 days old, and average 1½ lbs. There has been no disease; they are tender, plump, and delicate, the finest broilers on the market, and worth from

5 dollars to 6 dollars and more a dozen.

THE KILLING ROOM.

They move on to the killing room, 75 in a coop. A man strings them up by the feet, runs a lance into a blood vessel in the roof of the mouth, which causes copious bleeding, and then kills them by piercing the brain. The latter is an ingenious device, for it relaxes the whole system, so that the feathers come easily from the exquisitely tender skin without breaking it. After being "roughed," the bird is "pinned" of its smaller feathers; head, feet, and insides are left, and the whole remains through the day in running water, in order to remove the animal heat "by degrees." After spending the night in ice water, the broiler is ready for shipment.

THE "EGG-HOUSE."

The "egg-house" is a separate building, 537ft. long, with 60 pens, each containing 50 brown, buff, or Leghorn hens, selected for health, strength, and laying qualities, not for breeding. From these 3,000 hens come 200 dozen unfertile eggs a day. The production of unfertile eggs is peculiar to this one plant, where was first made the experiment of producing eggs from hens that have never been exposed to a rooster. Of course, an unfertile egg will not hatch, but it is far superior for market purposes, having a delicate flavour and unusual keeping properties. The yolk is a light yellow. Here, as in the "hatchery," the most exact system is in force, and the same methods of preventing brooding are followed. The market is with dealers who cater to the fashionable trade of the larger cities.

THE FOOD PROBLEM.

Of course, the food problem is extremely important. Here, as everywhere, so absolute a system prevails that even the size of an egg can be determined by feeding lime (shell) elements at a certain time. Finally cracked corn, mash and green-bone dust are used in both lines of the business. In the yards is scattered charcoal to prevent sour stomach, to which the proprietor attributes all diseases of chickens.

The mash is made by placing on a four-inch layer of dry clover a two inch layer of unhulled oats and turnips, made mushy and at the boiling point from steam; on this is placed a two-inch layer of bran, with a dash of hot salt water; then four inches of dry clover; then oats and turnips, as stated, and lastly two inches of middlings. By the time this has cooled, the moisture has been taken up by the dry clover, and the whole is thoroughly mixed. An important point is that the clover must be sweated and the oats steamed, not boiled, so that none of the ingredients are steeped out of them. Roughly speaking, the food plan is that the corn and oats make the meat of the egg and give strength to the chick; the bone is for the egg film, the bran and clover for the lime of the shells, and the turnip and potato as a relish. By watching results and studying experiments, the correct proportion of each element is learned for any one case. One may know just what materials are needed for a pie, but it does not follow that one can make a good pie just from that knowledge. The total feed bill amounts to only 1,200 dollars a year, from which the plant raises over 100,000 broilers and produces 875,000 unfertile eggs.

THE GREAT SYSTEM.

The great system is carried out in every detail. There is an engine-room and heating apparatus for steam and hot water, a laundry for the "nursery" flood cloths, a corn grinder, mash press, mash boiler, a shaver for potatoes and turnips, a chopper for clover, a provision cellar; and also, by the way, a great loft, in which the proprietor intends soon to place 6,000 pigeons to produce 1,000 squabs a day.

But the one thing more than any other to which the proprietor attributes his phenomenal success is the common sense of "kindness." He is a practical philosopher. He noted that when a man goes to his dinner contented and free from worry he enjoys the meal, digests it easily, and profits by it. If he is worried, tired, or ill at ease when he eats, he neither enjoys, digests, nor profits. This common-sense proprietor buys many wild Texas steers in Chicago every spring and ships them to his quiet, blue-grass Ohio farm. They eat nothing except grass, but day by day his men work at taming them. Gradually

the steers lose their fright and wildness, become contented and happy, and in the fall are sold back to Chicago at a heavy profit. By grass and kindness he has added from 100 to 200 pounds to each head. He has tried the same plan successfully with sheep. He makes it the foundation of his poultry and egg plant. During the three months of their lives his chicks never know a minute of fright

or rough usage. They find only gentleness, quiet, and content, and therefore they thrive. No sudden movement or noises are permitted. If an employee approaches a pen without first calling "Chick, chick," he loses his place. Upon such "little" things as these is built the largest poultry and egg plant in the world.

Tick Dip, and Plans of Tanks.

FORMULA OF NEL'S RUST DIP.

BY direction, the following, extracted from the interview of "Ergates" with Mr. Geo. D. Alexander (No. 8, Vol. 5), is republished.—

FORMULA OF DIP.

- 6lbs. Arsenic.
- 24lbs. Soap (common yellow).
- 24lbs. Washing Soda Crystals.
- 5 galls. Stockholm Archangel Tar.
- 400 galls. Water.

The dip must be boiled for six hours to ensure chemical mixture.

For heating purposes two 400 gallon tanks are used here. Fill only 300 gallons into each tank, and add 100 gallons to each tank after dip has been boiling for 5½ hours. If the tanks are filled to start with the dip will boil over, causing considerable wastage.

It is essential that the whole of the dip should be boiled, *i.e.*, it will not do to put all the ingredients into, say, one 400 gallon tank, and then to dilute this with water. This was tried in Australia, and was not successful. It takes about 3,500 gallons to fill the tank.

The dip should be used at a temperature of about 100 degrees. The dipping tank should be covered, and arrangements made so that no water can get into it. The dip can be used over and over again, fresh dip being added to make up the quantity removed by cattle, which is, roughly, rather less than a gallon per beast

"What is the value of a tankful of dip?"

"Let us work it out from the invoices :

40galls. of Stockholm tar	£3	4	0
192lbs. washing soda ...	0	19	9
192lbs. yellow soap ...	2	10	6
48lbs. arsenic ...	0	15	6

£7 9 9

Those are Maritzburg prices."

"What does the price come to per head?"

"The mixture, with its 3,200 gallons of water, comes to a little less than ½d. per gallon; a beast takes nearly a gallon away in its hair, and consequently the actual cost per head for materials for making dip comes to a little under a half-penny." Of course, this does not include cost of fuel for boiling dip, and labour, interest on outlay, etc.

"When a dipping is ended is the tank cleared out?"

"No. For the next dipping more is added to what remains."

"Is there any danger of the arsenic precipitating, and the residue becoming stronger than the formula?"

"None whatever. The mixture is a chemical one, not a mechanical one, as with some of the sheep dips in the market, which require constant stirring."

"How many beasts have you dipped, that is to say, how many passages through the tank have there been?"

"Over 4,100"

"And deaths immediate or attributable to the operation?"

"Two; both calves. They drank too much; calves do not go through so well as fully-grown animals. They are inclined

sometimes to turn round and swim back to the starting point, when, of course, there is the danger of meeting another going ahead. If two meet in that manner the head of one of them is likely to get some longish duckings, during which time more of the dip than is good for the youngster is apt to be swallowed. By putting a head-stall on the calf's head for holding it up after the first submersion, and guiding the animal through the bath all the small risk can be avoided."

PLANS OF NEL'S RUST DIP.

We are authorised to state that copies of plan of the Nel's Rust Dip, drawn to scale by Mr. George D. Alexander, may be obtained from the Natal Creamery, Mooi River; Agricultural Hall, Estcourt; and Mr. Herbert Blaker, J.P., Southdowns, Estcourt, and Department of Agriculture, Maritzburg, on application. Plans are also on exhibition at each Magistracy throughout the Colony.

Central Experiment Farm.

MONTHLY REPORT.

THE DIRECTOR OF AGRICULTURE—

THE atmospheric conditions during October have been more favourable for agricultural work than during the previous month. Rain fell on ten days, and 0.99 in. was registered on 28th, from which date the weather seems to have changed, and at the date of writing a very pleasant rain is falling.

Ploughing for the main crop of mealies has been undertaken, and greater progress would have been made had not some delay been experienced in replacing the team of oxen which was transferred to the Coast Experimental Farm. The hill ground has now all been ploughed with the exception of a small portion of the unbroken land near the implement shed. The 4-furrow disc plough has done very creditable work in the breaking up of this portion, and with some disc harrowing the ground ought to be in good condition for this season's planting. The vleiground has yet to be ploughed.

The mealies planted in August are coming on well, also the early planted potatoes; they are showing up nicely, and give every indication of a good crop. A small area of kaffir corn was planted for a revenue crop during the close of the month. The experimental work in all sections has been continued and kept up to date under the direction of Mr. W. Hosking, who has been acting as Field Experimenter since the transfer of Mr. Whelan to the Winkie Spruit Experiment Farm. While regretting the loss of the services of Mr. Whelan, who has been associated with me during the past

fourteen months, I congratulate him upon his promotion, and feel sure that his efforts in his new sphere will be attended with success equal to those in his labours here.

A large amount of labour and considerable care has been exercised in the preparation of the ground for the rice plots, but owing to an insufficiency of water in the spruit it has not been possible to flood the plots in accordance with your instructions.

The newly appointed manager for the Stanger Experiment Farm and the officer who is to take charge of the Farmers' Demonstration plots are both here at present engaged in acquiring a knowledge of the methods and systems of the work preparatory to taking over their various duties. As it is your intention to have two of the experienced members of the staff to execute part of the Farmers' Demonstration plot work, it will be necessary for their positions to be filled by the appointment of temporary hands. The fencing of the experiment pasture paddocks has now been completed, and practically the whole of the fencing on the Farm has now been undertaken.

A portion of the assistant's quarters is now being occupied; the house of the officiating analyst is in progress, and the bricks for the orchardist's house have been transported.

The necessary surveying, measuring and pegging of the drain and road has been done.

Native labour, which all along has been so unreliable, has been more satisfactory

of late, but as there are possibilities of our being able to secure the indentured Indians which were recently applied for, extra provision should be made for their accommodation.

It would be a consideration to the employees who are unable to leave the Farm except on Saturdays if the Kaffir mail,

leaving Maritzburg at 11 o'clock, could be again allowed to stop at Cedara. At present they are dependent entirely upon goods trains.

There were 17 visitors to the Farm during the month.

ALEXANDER REID,
Farm Manager.

Boxes or Baskets for C.O.D.

THE matter of C.O.D., says "Agricola" in the *Witness*, brings up even more forcibly than ever the necessity for cheap, easily procured boxes, baskets, and bags, for the forwarding of small quantities of fruit or other produce. There will need to be no "returned empties" to be thought about, or it will not be worth the bother to all parties concerned. We shall need small, strong carboard boxes, which are cheap enough to give away with the article, whatever it may be, or, rather, cheap enough to be charged for and not noticed by the consumer, who, in the long run, always has these things to pay for. The collecting of old boxes and tins cannot go on for ever, and we must look to the enterprising merchant to supply us with the necessary

articles in such sizes and at such a price as will enable us to use them freely, and yet not ruin ourselves with expense. These boxes have been imported by one or two fruit growers, through a merchant, on commission; but, as far as I know, no merchant has had the enterprise to import them "on his own," much as the need of them has been shown. I believe the English post office undertakes this sort of work, and also the railways in England, and I believe they supply their customers with the necessary boxes of such suitable sizes as are likely to be required, and the system pays well. Are our railway authorities to put themselves in the position of the private railway companies, and supply boxes at a reasonable cost?

Paspalum Dilatatum.

F. V. WAREHAM writes to the *Queenslander*:—During my recent visit to your splendid National Exhibition, I was much surprised to hear that the graziers and farmers of Queensland do not cultivate this grass, except upon a very, limited scale, my informants assigning as the chief reason for not doing so that they are afraid of it! and usually ask, "Can we get rid of it?" Why are they afraid of it, and why should they wish to get rid of a grass that has been proved by the stock-owners (chiefly dairymen) of the "Big Scrub" to be so valuable as a milk and butter producer, and fattener of all classes of stock? If they doubt it, let them return our visit, and examine

the district between the Tweed and Richmond Rivers, and see for themselves what marvellous results are being achieved wherever it is growing extensively, and what large average monthly returns are made from small holdings. These returns may be estimated by dividing the number of suppliers of cream and pigs to Byron Bay Co-operative Butter and Bacon Factory, into the total monthly or yearly payments distributed by this company. I was informed by one of the directors on the day we returned from your State that they had just paid £22,000 to suppliers for July. Now July is about the coldest month here, when grass is usually at its minimum growth; but with that aver-

age we are able to produce at the rate of £264,000 worth of dairy produce per annum, and every month the increase will be by great leaps and bounds, as the weather warms up, and more land is cleared and brought under cultivation.

It may be argued that when prices come down there will be a large decrease in the value produced, but this will not be so, as the output of produce will so greatly increase that it will more than counter balance the fall in prices. Unless ticks or other calamity visit this district, I predict that the output twelve months hence will be at the rate of £100,000 per annum. And Byron Bay factory is not the only distributor of wealth between the two rivers. There are others, the figures of which I am not at present in possession of.

For years past the cultivation of Paspalum grass has steadily increased. The great drawback at first was the cost of the seed—namely, 20s. per lb. When I first started growing it the price was 7s. 6d. per lb. This was, I think, eight years ago, and I have never regretted using it, but on the contrary, plant it wherever I clear new areas, and am satisfied that it has vastly added to the value of my land, by increasing its grazing capacity. The past two summers have taught those farmers who had previously neglected growing it extensively that no other grass—even buffalo—can resist drought, or keep perfectly green all through the winter, as it does; and during the last eighteen months thousands of acres in the aggregate have been laid down with it. In fact, if a landholder wishes to dispose of his land, when advertising its sale or lease, he states how much is under paspalum, so popular has it become here.

Does what has been above written appear that it is a grass whose introduction is to be dreaded? One thing may possibly follow its universal introduction into pastures, and that is the country will be able to carry so much stock that the prices of stock may fall.

In the land best adapted for it—namely, rich, peaty bungalow palm flats—four averaged-sized cattle may be

grazed to the acre for about nine months, and one and a-half to two beasts to the acre for three months, by judicious subdivision into small paddocks, and changing the cattle, so as to rest and feed off alternately. A fortnight in summer, I find quite long enough to rest a paddock of this class of land. The growth then of soft succulent fodder is refreshing to behold, and when stock are turned into it they lose no time in demonstrating how much they appreciate it. I had it growing all through last summer, and where shut up for seed it grew from 5 ft. to 8 ft. 6 in. high, according to the nature of the ground, in seven or eight weeks.

If the seed is planted in warm, moist ground, which has been previously ploughed and a light harrow run over it, and provided also that the seed is good, it will germinate in nine or ten days. Under favourable conditions it has been known to lie in the ground for twelve months, and when conditions favoured, it germinated. A good way to test the seed is to get a flowerpot or box filled with decomposed wood or old sawdust, scatter the seed, and keep the surface perfectly moist for nine or ten days. It is best to cover seed.

The Departments of Agriculture, both in New South Wales and Queensland, have done good work in trying to impress upon graziers and farmers its immense value. With the railway to the Tweed, it is not an expensive or long trip into the north-east corner of this State, and stockowners ought to come and see for themselves that what I have written is not a mere fabrication.

Dr. Louis Robinson considers that shying is "most distinctly a relic of a valuable ancestral instinct." The wild horse, swift of foot and clear of vision, feared few enemies when out on the naked plains; but every bush or tuft of long grass might, and often did, contain a fierce foe lying in ambush. Many and many a time must the wild horse have saved his life by a sudden swerve and leap in the opposite direction the moment he heard the rustle of leaves or descried some strange and dimly-outlined object among the underwood.

Sweet Potatoes.

WITH a desire, says *The Agricultural Magazine*, Colombo, to improve on the varieties of sweet potatoes available locally, we obtained through the help of Mr. T. W. Mollison, Director-General of Agriculture in India, 10 lbs. of each of these American varieties found suitable for India, namely, Nancimund, Virginia and New Jersey. In Ceylon the Southern Province is credited with growing the best sweet-potatoes, but the best we have seen were grown in Hanguranketa in the Central Province, where the tubers are not uncommonly, from 5 to 6 lbs. in weight, and are said to reach 8 and 10 lbs. each, and are yet mealy and free from fibrous tissue.

These plots of the American varieties referred to above have just been dug up. The plots were 15 feet by 3 feet in size, and the cuttings were planted one foot apart each way. Unfortunately the tubers, as soon as formed, were attacked by rats, and for some time, till the nuisance was abated, a good deal of damage was done in this way. The resultant crop weighed as follows:—Nancimund, 10½ lbs.; Virginia, 12½ lbs.; and New Jersey, 17½ lbs. Calculating the average produce per acre the crop works out between 14,000 and 15,000 lbs. The plots that have been lifted had the Vines supported on trellises. Other plots grown in the usual way are just about to be dug up. The tubers are of medium size, and though not quite as sweet as local varieties, are of excellent quality. More than one authority considered them the best potatoes he had yet met with. Cuttings of all three varieties have been freely distributed to School Gardens in all parts of the Island.

In this connection we give below the "Recipes for Cooking Sweet Potatoes," published under the authority of the Commissioner of Agriculture for the West Indies, and have no doubt that they will be very acceptable to our readers.

FRENCH FRIED SWEET POTATOES.

Cut cold boiled potatoes in thin slices. Season with salt, put them into the fry-

ing basket, and cook in lard for five minutes.

GLAZED SWEET POTATOES.

Cut cold boiled potatoes in slices about an inch thick, and season well with salt and pepper. For a quart of potatoes, melt half a cupful of butter, and add two tablespoonsful of sugar to it. Dip the slices in this liquid and lay them in a large pan. Cook for twelve minutes in a very hot oven in which time the potatoes should turn a rich glossy brown. Serve hot.

ESCALOPED SWEET POTATOES.

Slice sufficient cold, boiled potatoes to make three pints, and sprinkle with a teaspoonful of salt and pepper. Butter a large shallow dish, and spread the potatoes in it, making a layer not more than an inch thick. Melt one-third of a cupful of butter in one-fourth of a cupful of boiling water, and after sprinkling a quarter of this liquid over the potatoes, put them into a hot oven. In ten minutes sprinkle another quarter of the liquid over them, and repeat the act twice at intervals of ten minutes. After the final sprinkling bake for ten minutes.

SWEET POTATO PIE.

One quarter of sweet potatoes boiled and mashed, three beaten eggs, three tablespoonsful of sugar, one tablespoonful butter, half a nutmeg (grated), half a teaspoonful ground cinnamon, a little ground cloves, a little lemon peel, and enough cream or milk to make the mixture of the consistency of batter. Make some rich pastry, line your dish with a part, pour in the mixture and bake with a top crust.

SWEET POTATO PUDDING.

Two coffee-cupsful of mashed boiled sweet potato, one teacupful of sugar, one teacupful of butter, four eggs, one teacupful sweet cream, one teaspoonful cinnamon, one grated nutmeg, one teaspoonful of almond or vanilla essence.

and a pinch of soda dissolved in a teaspoonful of water. Beat the eggs light, add the sugar and butter rubbed to a cream, stir all together with three mashed potatoes until hot. Line a deep plate with puff paste, pour in the mixture. Bake in a moderate oven. When done, cover the top with slices of fruit, marmalade, and sprinkle thickly with granulated sugar.

SWEET POTATO RICE.

Boil sweet potatoes until tender, press them through a colander on to a hot dish, shake the colander lightly every other minute to cause the potatoes to fall off in short grains like rice, serve very hot. This will be found a nice accompaniment to any meat course.

SWEET POTATO RISsoles.

Boil and mash the potatoes, add pepper and salt, and, when liked, a little minced parsley. Shape the rissoles, cover them with egg and bread crumbs, and fry until a light brown.

BOILED SWEET POTATOES.

Boil the potatoes in water with their jackets on, and peel and cut in slices before serving.

STEWED SWEET POTATOES.

Peel and slice about four or five pounds of sweet potatoes, take a cup of sugar, a tablespoonful of flour, a tablespoonful of butter and a little salt. Lay the sliced potatoes in an enamelled saucepan in layers sprinkled with sugar, butter and flour, and after adding the last layer pour over it a cup of water. Stew gently, giving the pot an occasional stir.

RECHAUFFE OF COLD SWEET POTATOES.

Mash the potatoes until perfectly free from lumps, stir into every pound of potato two tablespoonsful flour, two ditto minced onion, and 1 oz. butter, add sufficient milk to moisten them well, press the potatoes in a mould, turn out and bake in a moderate oven until nicely brown.

SWEET POTATO BREAD.

One cupful of mashed potato, one cupful of corn meal, one cupful of flour, two

teaspoonsful baking powder; mix quickly, and, if too stiff, add more milk, bake in a hot oven.

BOILED SWEET POTATOES.

Potatoes to be half boiled, the skin removed, and put into the oven or before the fire until done. They ought to be of a nice brown colour; cut in pieces, serve hot.

TO COOK DRIED SWEET POTATOES.

Pour boiling water over them the night before they are wanted, next day boil, peel and dress with butter.

ROASTED SWEET POTATOES.

Lay them before the grates of the stove or in the oven, turning them occasionally until cooked. Scrape off the outer skin and cut into pieces or crush with butter and serve hot.

SWEET POTATO FRITTERS.

Half a pound of sweet potatoes, boiled and mashed, one tablespoonful of flour, two tablespoonsful of butter, two eggs, and a little salt. Mix all well together, make into little flat cakes, and fry in boiling lard. Serve with sugar and cinnamon.

In 1883 some interesting statistics respecting the comparative values of English and foreign horses for work on the London streets were laid before the Camberwell Vestry, which had been making an experiment with the view of ascertaining which were best for use in the dust, water-carts, etc. Between May, 1876, and March, 1883, fifteen English and fifteen foreign horses were purchased; the importations from France were chiefly Flemish-bred, very high in the crest, thick in the neck, and heavy in the barrel and hind-quarters; the English horses were of a good stamp with plenty of bone, heavy in build, and not carrying overmuch fat. Of the fifteen English horses, during the seven years, one had to be sold, one died, and one had to be slaughtered. Of the foreigners, three had to be sold and four died or had to be slaughtered. The English horses cost on an average £70, while the Flemish horses cost an average of £66. After working on the streets for a time the latter began to go to pieces; they lacked the "wear-and-tear" qualities of the English-bred animals, and showed signs of deterioration after about three years' work.

Hints on Chicken Rearing.

A LENGTHY list of hints on chicken rearing, for the assistance of poultry-keepers of moderate experience, has been obtained from the leading breeders in the State (says the *Sydney Daily Telegraph*). Of course, a diversity of opinion is expressed on several points, but none the less any or all are worthy of consideration. A first instalment of these hints is given as follows:—

My chickens are dry fed from the start. They always have chicken mixture, and bone, and shell grit in front of them. They get meat or green cut bone every day. They are in the brooder-house with grass runs until they are old enough to put out in the orchard in colony coops, where they remain until they are about to lay, and then they are penned. I find this method much the best—it is less trouble, the mortality is trifling, and the chicks get a better start in life.—James Stewart, Berowra.

For incubator chicks, temperature in the brooder 80 deg. for the first five weeks, and then even in winter I turn out each batch of chicks in a separate run, with a well-protected wooden box as a house, and without artificial heat. Dry feed, mostly Pemell's chicken mixture, and rolled oats. Green-cut bone and finely-cut green barley every day. Frequent change of water; scrupulous cleanliness of brooders and boxes; incessant war on the lice; strict separation of sexes as soon as they can be differentiated. For chicks with hens the same rules apply, with this difference, that the mothers are kept each in a coop scattered about the vineyard, to give the chicks ample room for running about.—Dr. Fiaschi, Sackville.

Feed when 30 hours old. First week give hard-boiled egg mixed with oatmeal. Give warm milk first thing in the morning; rest of the day water. After the first week feed on cakes made of one part bran, one pollard, and three oatmeal, moistened with milk and baked until crisp. Crumble this to size to suit—or

give boiled oatmeal mixed with dry meal until it crumbles. Until five weeks old give potatoes and rice daily, and scraps of meat. Then feed on pollard, cracked maize, and wheat. Always have food and water before them, and be careful the grain is cracked small. Keep the drinking vessels clean. If grass is not available give any kind of greens, chopped small. Keep the chickens sheltered from wind.—W. H. Ponton & Son, Tuggerah Lakes.

I look upon it as quite as necessary to kill the head lice as it is to give good food. I go through each brood when about a week old, and again when a fortnight, and with a small brush anoint each chick on the head and under the throat with a mixture of one-part creosote to 10 of olive oil. Never doctor ailing chickens—kill them.—Harold Cadell, Epping.

First day give nothing; second and third oatmeal and bread crumbs, a little and often. Then I gradually give mash of bran, pollard, and oatmeal scalded with soup in the morning; at 10 A.M. Arnott's dog biscuits, soaked and dried crumbly; 2 P.M., table scraps dried crumbly; 4 P.M., flaked oatmeal. After the first week gradually add cracked corn, wheat, or anything that they will eat, with plenty of green stuff (lettuce for preference), water, and grit. Above all, keep them scrupulously clean.—G. H. Bayley, Croydon.

A species of acacia which grows very abundantly in Nubia and the Soudan is called the "whistling tree" by the natives. Its shoots are frequently distorted in shape by the agency of larvae of insects and swollen into a globular bladder from one to two inches in diameter. After the insect has emerged from a circular hole in the side of this swelling, the opening played upon by the wind becomes a musical instrument nearly equal in tone to a sweet-toned flute. The whistling tree is also found in the West Indian Islands.

Queensland Tick Fever.

AT the present time, says *The Queensland*, the tick pest seems to be giving little trouble. Where dipping takes place regularly scarcely any complaint is made. In the neighbourhood of Nerang, on the New South Wales border, it has been found that the ticks do not produce disease. That is the experience of the Queensland Stock Department, and also of Mr. J. D. Stewart, a veterinary officer in the employ of the New South Wales Department, who has been making an inspection.

The Chief Inspector of Stock, answering a question on the subject recently, said inoculation gives immunity for a period if the proper blood is used; but experience has shown that the immunity is not permanent, and also that the blood is uncertain, as it does not always follow that the blood of an animal that has been through a severe form of the

disease will prove effective. It is true, however, that there is not such a percentage of loss among inoculated cattle as among those not inoculated, even some time after the operation. The time for the inoculation effects to last is put down at about three years.

Under all the circumstances, the Department strongly recommends regular dipping, as it helps to keep down the ticks, and prevents worry to the beast. Some idea of the benefit of prevention measures such as these may be gained from the statement that a fully-matured female tick will lay as many as 2,000 eggs. Even where the dipping is not effective in removing the ticks altogether, it makes them sterile. The period between the dipping varies with the infestation. Where the cattle are thickly infested they should be dipped once a month.

Soil Nitrification and Mosquitoes.

UNDER this title an important paper is contributed to the current number of the *Lancet* by Dr. Waddell, of Potters' Bar, who describes a series of experiments showing that the presence in water of even a very minute quantity of ammonia is fatal to mosquito larvae, and leading to the conclusion that, while ammonia is a poison to them in all its combinations, the contained nitrogen unit is the index of effectiveness. He infers that in the effective nitrification of the surface waters and vegetation through the medium of the soil we have a force of enormous potentiality in the crusade against malaria, and one which is capable of practical application. Nitrification may be brought about in two ways—first, by the direct application of nitrogenous manures, and, secondly, by fostering the growth of certain plants belonging to the leguminosae which are known by their peculiar root action to

add to the nitrogen in the soil through their relations with certain earth bacteria. The growth of these plants may be encouraged by the use of phosphatic manures, and also by treating the ground and the seed to be sown upon it with cultures of the earth bacteria referred to, which are sold commercially under the name of "nitragin." Dr. Waddell calls attention to the inhibitory influence of ammonia upon various low forms of animal life, and suggests that culture methods might be tested upon a large scale both in India and in the Campagna. They would have the incidental advantage of being in themselves profitable, and he thinks it probable that the methods of modern agriculture may have largely co-operated with drainage in bringing about the disappearance of malarial fevers from this country.—*The Times*, June 9.

Romney Marsh Sheep.

(See Illustration.)

THE Romney sheep are a long woolled, highly valuable, and particularly hardy breed of sheep. They bear their cold and exposed situation well, and require no artificial food during the hardest winter. At three years old the wethers weigh 150 lbs. and over. The wool is tolerably fine, and the average

weight is about 6½ lbs. The natural pasture of these sheep is rich. By crossing with Leicester blood the length of body and long leggedness formerly characteristic of the breed have been done away with, and at no interference with the original hardiness of the breed.

Forest Transplants for Sale.

TO encourage tree-planting, Transplants and Seeds of Forest Trees are supplied by Government, so far as in stock, at the undermentioned rates, exclusive of carriage, from the Government Nursery, Central Experimental Farm, Reit Spruit.

Transplants of Eucalypts, Pines, Acacias, Casuarinas, Cupressus, &c., about 25 trees in each tin, at 8s. 4d. per 100 trees.

Transplants of scarce kinds, larger trees, or surplus stock, when available, will be charged at special rates, which will be furnished on application.

Tree seeds, in variety, at 1s. per packet. Price per pound, which fluctuates, will be furnished on application.

Orders for present or spring delivery

should be addressed to the Conservator of Forests, Pietermaritzburg, and must be accompanied by a remittance in cash or postal order. Cheques cannot be accepted.

T. R. SIM.

Conservator of Forests.

Office of Conservator of Forests,

13th August, 1903.

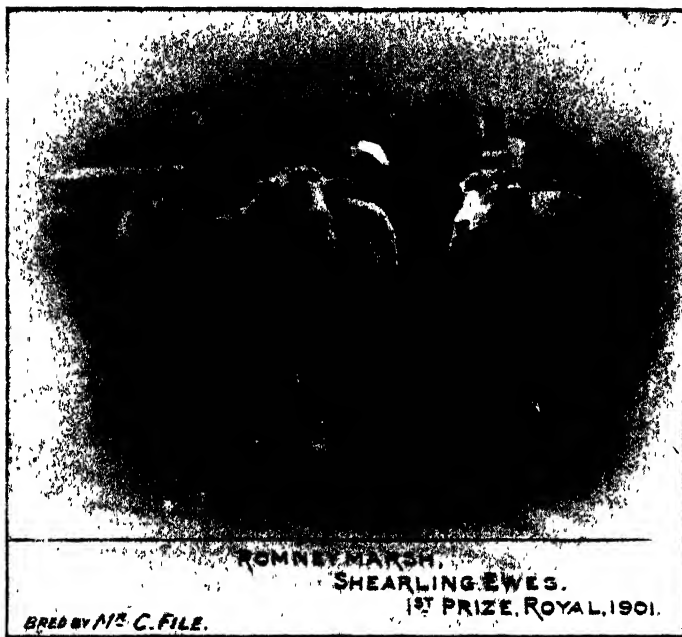
* [In connection with the supply of transplants and forest trees to the public, by the above re-published notice, attention is drawn to the large number of letters which become subject to delay through being addressed to the Manager of the Central Experiment Farm instead of to the Conservator of Forests, Pietermaritzburg.—Ed., *Agricultural Journal*.]

A Cobra Story.

A CORRESPONDENT in Rhodesia writes to London "Field":—"The following will probably prove interesting to some of your readers. On March 28 last I sat a hen on 12 eggs. All went well until April 9, when a large snake made its way into the sitting-house, and after driving the hen off her nest, swallowed the whole of the sitting. I shot the reptile, and opening it up discovered that nine of the eggs were unbroken, so I rinsed them in warm water, and placed them back in the nest. The hen took to them again quite calmly.

This morning I found that the whole of the nine had proved their fertility, and the chickens appear quite healthy, regardless of the shaking the eggs underwent during the death struggle of the serpent, which proved to be a splendid specimen of what is known locally as the "banded cobra," and measured 6 feet 7 inches in length, with a girth of 8 inches. Unfortunately I mutilated the body at the hood, the shot completely severing the head, or the skin would have been worth preserving.

ROMNEYMARSH SHEARLING EWES.



FIRST PRIZE ROYAL, 1901.

(See Article.)

By the courtesy of Messrs. Cooper & Nephews

Meteorological Returns.*Meteorological Observations taken at Private Stations for Month of Oct., 1903.*

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same per'd from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.		
Central Experiment Farm (Manager)...			98	33	1'35	10	99	28th	2'70	...
Estcourt			96	35	1'90	5	82	28th	3'52	5'66
Nottingham Road (C. J. King)	2'23	12	54	28th	4'36	7'51
Adamshurst (Wm. Adams)			96	46	1'35	7	30	16th	2'72	4'83
Hilton (Henry V. Ellis)			96	42	1'81	12	80	28th	3'87	4'98
P.M.B., Town Bush Valley (Wilkinson's Nursery)	2'15	13	73	28th	4'62	...
Ixopo, Gorton (Chas. Green)			90	48	77	4	55	29th	1'47	3'36
Mid Illovo, Ismont (A. N. Montgomery)			93	46	78	8	65	28th	1'66	9'65
Mount Edgcombe (Natal Estates)			97	54	1'49	9	38	5th	4'19	8'79
Cornubia	1'51	...	...	...	4'52	9'47
Milkwood Kraal	97	...	...	...	2'85	6'62
Blackburn	1'23	...	...	...	3'67	8'50
Saccharine	1'19	...	...	...	3'33	...
Prospect Hall	1'06	...	...	...	3'72	9'09
Clairmont (J. R. Blamey)	1'82	8	45	29th	5'63	8'29
Equeefa (W. Hawksworth)			97	54	2'0	6	133	29th	4'76	9'05
Umzinto, Beneva (E. W. Hawksworth)	1'70	5	65	28th	4'56	9'64

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of October, 1903 :—

October, 1905. —											
Name of Colliery.	Labour Employed.						Unproductive Work.*			Coal raised. tons. cwt.	
	Above Ground.			Below Ground.							
	E.	N.	I.	E.	N.	I.	E.	N.	I.		
Natal Navigation	... 24	176	149	21	417	75	8	16	...	15,034	13
Elands Laagte	... 12	21	198	12	185	260	3	8	5	10,898	19
Dundee Coal...	... 15	14	175	14	121	308	2	21	31	10,286	1
St. George's ...	... 13	72	76	9	275	92	1	9	...	8,820	0
Glencoe ...	... 14	121	78	12	290	14	1	15	2	7,267	0
Natal Steam Coal	... 2	50	6	3	150	2	1	1	...	3,436	11
Newcastle ...	... 5	11	12	4	129	4	15	99	2	1,993	1
No. 42 ...	... 4	20	15	2	88	2	...	...	...	1,811	8
Durban Navigation	... ...	...	...	...	...	...	49	291	47	1,697	0
West Lennoxton	... 2	5	16	2	33	28	...	5	...	1,554	5
Natal Merthyr	... 2	29	3	2	90	3	3	11	1	1,325	14
Ramsay ...	... 2	12	10	2	35	35	5	27	11	1,291	12
Central ...	... 3	39	5	2	106	5	...	...	...	1,208	18
Crown ...	... 2	4	32	2	26	4	...	...	...	784	0
South African	... ...	...	...	2	34	2	19	90	12	388	10
Hlobane ...	... ...	...	...	1	2	...	...	...	...	49	2
Zululand ...	... ...	...	...	...	...	...	11	83	...	32	15
Vrede ...	... 1	4	...	...	...	...	...	...	...	7	10
Total ...	... 101	578	775	90	1,981	834	118	676	111	67,886	19
Corresponding month, '02	137	465	740	98	1,425	964	5	72	47	46,176	16

* Cost charged to Capital Account.

November 10th, 1903.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of October, 1903 :—

					tons.	cwts.
Bunker Coal	...	...	...	...	30,077	2
Exported to :—						
Cape Colony	...	...	...	...	262	13
Beira	...	...	...	...	184	1
Chinde	...	...	...	...	3	8
Las Palmas	...	...	...	...	1,007	13
Total (all Colonial coal)	...	...	...	...	31,534	17

Customs House, Port Natal,
November 2nd, 1903.

(Signed) GEO. MAYSTON,
Collector of Customs.

Pound Notices.

THE following stock, unless previously released, will be sold on the 16th December next :—

Estcourt.—Black cow, about 3 years old; white on udder and stomach, white specks on left hind leg. Bull calf, colour black, of said cow, 2 months old. Red ox, no brand, white brush tail, two slight white marks left hind leg, age 5 years. Three black sheep and one lamb; branded J.V., running on the farm of F. Symons, Glenbella.

Howick.—Running on the farm Boschfontein, Balgowan. Ox, black, 3 years old, swallow tail—in tips of both ears—no brand; 23 mixed goats, impounded from Dargle.

Pietermaritzburg.—Bay pony, gelding, hogged mane, short tail, height about 13.3, aged, old saddle marks, branded $\frac{ER}{K}$ with small brand immediately below.

Mahlabatini.—Black cow branded C N on right buttock, square and half-moon out of left ear. Red cow, no brand or marks. Black bull calf, no brand or marks. Black bull calf, no brand or marks. Grey bull calf, no brand or marks.

Nqutu.—Dark brown mare mule, about 13.2 high, brand looks like N off-shoulder, S on near hind quarter.

Woodstock.—Grey pony, hind legs white up to knees, right fore leg white up to knee, shod all round, halter, face nearly all white, branded what looks like an anchor on right hip.

Erin, Dronkvlei, Division of Ixopo.—Black sow, about 3 months old.

Running on the farm Exchange.—A brown filly, long mane and tail, both front and off hind feet white, no brand visible.

Inhlazatje.—Dark bay pony, about 13.2, aged, saddle marks.

Ladysmith.—Small black cow, no brands or ear marks, about 5 years old; black heifer, white belly and front part forelegs, branded indistinctly, looks like π on right hind quarter, swallow tail in end of right ear, square cut out of back, left ear square taken off back, about 2 years old.

Weenen.—Bay mare, pony, black points grey mare, pony, no brand.

Dannhauser.—Brown gelding, branded A; grey gelding, no brands, hogged mane.

Mooi River, running on the farm Exchange.—A dark brown stallion, long mane and tail, badly affected with mange, no brands visible; probable value, £5. The above animal will be sold at the expiry of one month from this date (1st November), if not previously released.

Greytown.—Black ram Kafir goat, swallow tail in point each year, age about 10 months; probable value, 15s. The above animal will be sold at the expiry of one month from this date (7th November), if not previously released.

Weekly Rinderpest Report up to 10th November, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 26th May, 1903 to date.
<i>Zululand.</i>			
Eshowe District	12	8	331
Umlalazi District	15	11	177
Nkandla District	2	3	304
Mahlabatini District	9	9	188
Entonjaneni District	5	15	26
Lower Umfolosi District	...	1	...
Nqutu District...	2	...	2
<i>Vryheid District.</i>	4	5	232

S. B. WOOLLATT,
10th November, 1903. P. V. SURGEON.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 45a.—Englishman, 29 years of age. Has had five years' experience in Manitoba, Canada, and is acquainted with the management of horses and cattle. Possesses an "Exemplary" certificate from the O.C., B.M.I., with whom he served throughout the late war.
- No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30, with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well-up in market gardening.
- No. 53a.—Englishman, 27. Has been on an agricultural and stock farm all his life. Is well up in dairy work, and is the holder of several certificates and awards won at the Royal Agricultural Shows, Victoria. All recommendations speak well of applicant and his work.
- No. 54a.—An Italian of 28. Has a good knowledge of fruit and viticulture. Is at present residing in Italy, but is anxious to emigrate to Natal. Is a qualified land surveyor, and is conversant with the construction of roads and irrigation canals, and general agriculture.
- No. 55a.—Is at present in India where he carries on tea planting on an extensive scale. Owing to the unfavourable seasons lately experienced is anxious to obtain a footing in Natal.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 65.—Applicant is 30, and appears to have been accustomed to rough farm work in Ireland, where he was on his father's farm. Understands the cultivation of potatoes, turnips, mangels, cabbages, oats, wheat, barley, and rye. Is anxious to acquire knowledge of farming under South African conditions.
- No. 66a.—Australian of Scottish parentage, 38 years of age, and has been in close touch with farming in Australia. Has had large experience of wattle growing.
- No. 67a.—Welshman, aged 27. Was overseer on a sugar estate in Demerara. Understands the cultivation of sugar, bananas, rice and certain tropical fruits. Is anxious to acquire local experience, and if necessary, would be prepared to accept a post on a month's trial without pay.
- No. 68a.—Scotchman of 28, well educated, seeks situation on a farm with light duties, such as overseer, storeman, or tutor. Will give services in return for board and lodgings in comfortable home.
- No. 69a.—Englishman, 39 years of age, who has had extensive experience in stock and agricultural farming in South America and New Zealand, is anxious to get on to a large and up-to-date farm in Natal, to acquire local experience. Produces good recommendations.
- No. 70a.—Correspondent writes from Johannesburg stating that he would like to obtain light employment on a farm for about twelve months. Is prepared to pay a premium if necessary.
- No. 71a.—Scotchman, 29 years of age. Up to three years ago was farming in Forfarshire, Scotland, where mixed operations were undertaken. Is accustomed to the management of dairy and feeding stock, horses, and sheep. Has had about a year's local experience. Produces good Home and colonial references.

The State Entomologist, New Jersey, in a report on mosquito, mentions that the cleanest and most effectual material for keeping of mosquitoes is oil of citronella. This oil is obtained from a grass, "*Andropogon nardus*," and is used in the manufacture of cheap grades of perfumery. The odour is not unpleasant, is lasting, and effectually keeps off all kinds of mosquitoes. It may be applied on the hands and face or other exposed parts of the body.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. G. Maritz ...	Springbank
		"	P. H. Boshoff ...	Riet Vlei
		"	N. Robbertse ...	Spitzburg
		"	A. C. Harding ...	Meadow Bank
		"	A. J. Harding ...	Marshlands
		"	J. Snyman ...	Vitzicht
		"	J. B. Vandermerwe	Welgekosen
		"	B. J. Vandermerwe	Noodhulp
J. Button ..	Estcourt, South of Bushman's River	"	J. Lawrence ...	Grantleigh
		"	W. Fletcher ...	Erina
		"	F. Symons ...	Glenbella
		"	D. Mackay ...	Dalton
		"	C. Cope ...	The Hoek
		"	C. R. Leroux ...	Moras Vlei
		"	P. Ballantyne ...	Bigger
		"	J. C. Boshoff ...	Waterhoek
J. J. Hodson ...	Lion's River ...	"	D. C. McKenzie...	Lion's Bush
		"	R. J. Spiers ...	Owthorn
		"	Jas. King ...	Lyndoch
		"	P. D. Kimber	Maritzdaal
		"	H. W. Shaw	Talavera
		"	G. & B. Hutchinson	Boschfontein
E. J. B. Hosking ...	Upper Umkomanzi	"	O. P. Lewis ...	The Hill
A. Brown ...	Polela ...	"	C. A. Phipson ...	Strathcampbell
		"	J. Comrie ...	Hepburn
		"	H. Pennefather ...	Home Rule
		"	T. Palframan ...	Watermead
		"	A. C. Thurston ...	The Rocks
		"	J. D. Watson ...	Rainbow
		"	D. O. Arbuckle ...	Kenridge
		"	J. Hayes ...	Glen Gariffe
		"	Leslie Bros. ...	Dunera
		"	S. Maritz ...	Maritzdale
R. Vause ...	Ixopo ...	"	W. H. Walton ...	Greenvale
		"	A. E. Keith ...	Norwood
		"	J. Harper ...	Balnahard
		"	A. Knight ...	Highflats
		"	K. Houston ...	The Donga
		"	G. Houston ...	Oloverton
		"	G. Cooper ...	Avebury
		"	G. Kippen ...	Kippen's Retreat
J. A. Trenor ...	Alfred ...	"	F. W. Robinson ...	Car End
		"	Umpapu	Location
		"	Gelatu Duly Um-	Location
		"	banjana ..	Whetherby
W. Gray ...	Upper Tugela, South of Tugela River, and Estcourt, North of Bushman's River ...	"	R. Mack ...	
		"	W. P. Gray ...	The Heff
		"	J. van der Westhuysen	Misgunst

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
A. H. Ball ...	Weenen	Scab	T. Hair S. O. Van Rooyen C. Van Rooyen ... Mrs. P. Lotter ...	Gretna Green Middleburg Scottsberg Schottspoort
E. Varty	Umvoti, Western Portion	"	W. F. Marshall ...	Mountain Side
G. N. Perfect ...	Umvoti, Eastern Portion	"	Baletshe T. Hill	Matimatolo Came
R. J. Raw	Impeudhle ...	"	S. Faber H. Hill Maqundo	Virginia Coquidale Natal Colonization Farm
C. Swales	Umlazi	Lungsickness	P. W. Department Native, Sam Pawkes	Richmond Farm, near Pinetown Assegai Kraal, near Betha's Hill
A. Hair	P. M. Burg City and Umgeni	Scab	John, & Mr. Kirk Umbabana	Umlazi Location Zwarikop Location
E. G. Clerk ..	Newcastle	Lungsickness	Dundu S. W. Reynolds ...	Styl Krantz Newcastle Town Lands
		"	Madonez, Nanga- shon & Ingovaan	Twefontein
		"	Somsen & Barge	Dumferline
		"	L. H. S. Jones ...	Newcastle T. Lands
		Scab	W. A. Laig ...	Millstone Spruit
		"	J. T. Watson ...	Bismarck
A. J. Marshall ...	Dundee	"	S. M'Lief N. B. Surtees ... Hlubi Gunena ... Esaw Kumalo ... A. G. Spiers ...	Greenock Gaisford "Clifton" Jackalsfontein
C. E. Walker ...	Umsinga	"	Mshlaowla Utshezi Matoli Ra Majola Ugomba Mtshela Kumalo... Ganyana Stole ...	Mangabayeni Nkomunye Vaalkop Vermaak's Kraal Mumbe
J. Chaplin	Klip River ...	"	P. Nicholson ... P. K. Dalebont ... Stomoko J. Stomoko Botchu Luchaba... Umboishwa Thompson and Natives P. H. de Villiers J. Bardner Umveli Umkuzanywayo ... D. R. Bester J. Bester	Hobsland Maggiesdale Blauwbank Reit Kuni "Vlaakplaats" Doornkloof Good Hope Brakwaal Stockville Blauwbank Quagga's Drift "

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
J. M. Wales ...	Upper Tugela, N. of Tugela River	Scab	S. Sharratt ... J. Reed ... G. H. H. Coventry	Klein Waterfall Fairfield Fair View
R. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ... P. Uys ... M. Gregory ... H. Potgieter ... — Engelbracht ... J. Allen ... W. Haines ... H. Benkes ... P. H. Nel ...	Charlestown Blood River Frischegwald Rooipoort Spitzkop Grootvlei Klipspruit Roodekop Blauwstroom
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe ... Sikwata ... L. Botha ... Ndotyane ... Hawse ... J. R. Steenkamp... G. H. Steenkamp W. Pretorins ... Z. de Jager ... W. Havermann & Kun	Emyati " " Waterval Rustplaats Kromellenbourg Rustplaats Bloemhoff Denny Dalton Langfontein
		Lungsickness	W. Magee ... J. Doyer & Fuhlo C. Birkenstock ... Nqumbi ... Inkunya ... Nqume ... Jonas ... J. Coetzee ...	Denny Dalton Hartskamp Hlobana Emyati Tweefontein Vredehof Bloemendal Grootgewacht
C. T. Vaughan ...	Paulpietersburg ...	"	Mcatu ... W. Craig ...	Haasfontein Frischegewaagd

The Province of Zululand is an infected area under the Lungsickness Act. Individual cases under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 3 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Ehtonjaneni

Districts ...	...	1 for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	1	" "
" North of White Umfolosi and Umfolosi Rivers	...	1	" "
Total ...	...	3	0

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkandhla, Entonjaneni, Nqutu, and Lower Umfolosi Districts.

Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 11th November, 1903.

District Reports.

BULWER, 6th November.—Nice rains have fallen in most parts of this Division during the last fortnight and the grass is good in most parts. What is so extraordinary is the wintry cold changes for this time of the year, which is bound to injure and retard the young crops

which are always late in the higher portions. I am glad to say that mange in horses is not so prevalent; more attention is being given to eradicate the disease. All kinds of stock in the District are fast putting on flesh and getting rid of their rough winter coats. Lightning has been

very destructive in the Division; within the last week one Native (man) at Inpudwini was struck dead, and two oxen and a Native man near Half my Right were also killed by the same thunder-storm.

H. W. BOAST, Magistrate.

EMPANGENI, 7th November.—During last month the weather was very dry and windy, and at times unpleasantly warm. Rain fell on twelve out of the thirty-one days, the heaviest fall occurring during the night of the 28 h. Stock are doing very well; only three deaths were reported. Crops did but badly owing to the incessant high winds—particularly hot winds—drying up what little moisture the several recent rainfalls provided. Chief Mgedi's people are most fortunate in having small quantities of green mealies and pumpkins to eat. The only amabele which did at all well was in certain fields in the location of Chief Bejane, and about the neighbourhood of the Mbabe. Here, in the south portion of the Mletwa location, locusts were strongly in evidence on five occasions during the month, but the constant high winds kept them on the move continually, and, so far, no definite reports as to their having started laying their eggs anywhere have been received.

A. R. R. TURNBULL, Magistrate.

IXOPO, 28th October.—The heat duri g the last fortnight has been excessively severe, and dried up the ground and burnt off the grass, but at last the long-wished-for rain has come, and not before it was really wanted, as at present there are few wagons riding transport, with a result it is impossible to get goods from Richmond or Umziuto, and the Natives are very short of food, and, I fear, will be starving before February. Many are going out to work, but, unfortunately, to the Transvaal, where the temptations to spend their money seem to be great, and as their services are more urgently required on the Cape-Natal Line, which will benefit this Division and enable the people to receive food; it therefore seems a pity that there is not a special fee of £1 to Natives leaving the Colony to work. In the event of the African Coast Fever approaching Natal, I think the residents of villages who possess a few cattle should approach the Government with a view of erecting Dipping Tanks on the £1 for £1 principle. During the recent Circuit of the Native High Court, five Natives were indicted on separate counts for cattle-stealing, or theft of an ox, sheep, goats, and pig-killing. Three were acquitted; one was convicted of stealing an ox, and sentenced to two years and twenty-five lashes; and the Acting Chief Mboza pleaded guilty to sheep-stealing. This Native was tried some time ago by the Magistrate of this Division, before the jurisdiction of Magistrates was reduced on the creation of the Native High Court, and on that occasion this Court sentenced Mboza to two years' hard labour and twenty-five lashes, but the Judge President, Native High Court, refused to take the present charge as a second conviction, as the Prosecutor, Native High Court, had omitted to serve a formal notice on Mboza. This point was argued by the

Clerk of the Peace, who contended that the case before Native High Court was a second conviction, as a copy of the previous conviction had been put in at the preliminary examination, and Mboza was liable to six years and thirty lashes—*vide* Section 57, Act 1 of 1899—but his Lordship held as the Prosecutor, Native High Court, had not served the required notice, that this must be treated as a first conviction, and sentenced Mboza to twenty months' imprisonment with hard labour, and twenty lashes. Sheep-stealing seems to be on the increase, although Detective-Officer Walton continues to do good service. Mboza was caught red-handed by the detectives.

FRANK E. FOXON, Magistrate, Ixopo.

MAHLABATINI, 3rd November, 1903.—The month was a very hot one, notwithstanding the fact that rain fell on nine days; 3.23 inches of rain fell. The greatest fall was on the 28th, when 1.22 inches were registered. Natives are busy planting in all directions, and judging from the energy displayed, if the season turns out favourable, a record harvest may be expected. Several fresh outbreaks of Rinderpest were reported during the month, in the majority of cases transport oxen being directly responsible for the outbreak. Since the rainfall on the 28th the country has put on a beautifully green appearance, and grass will soon be plentiful for all classes of stock. The demand for mealies continues at £2 per muid of 200 lbs. The Natives are very much handicapped in procuring the necessaries of life, as their spare cash is exhausted, and storekeepers decline to take stock in exchange for mealies. Messrs. Symmonds & Sons are about the only ones who still take stock at their trading stations, but, of course, at greatly reduced prices. I am glad to say the natives of the district have turned out in large numbers—young and old—to seek work, and it would be difficult to supply any large requisition for Road party natives at present. It would be a great help if employers could induce the natives to send their money home to relieve the distress of those left behind and dependent on them. I would willingly receive any remittances and send word to the remitters, but care must be taken to mention the name of the Kraal head, his chief, and the locality (hill or stream) where the remittee is resident. An outbreak of Lung-sickness has just been reported by the local Inoculator amongst a herd of cattle belonging to Messrs. C. E. Symmonds & Sons at the White Umfolozi drift. The herd has been quarantined.

A. J. MARITZ, Magistrate.

NKANDHLA, ZULULAND, 31st October.—The weather has been very warm, and strong winds have prevailed; practically no rain fell until the 28th instant. The total rainfall was 2.98 inches. The maximum temperature was 89 degrees, and the minimum 37 degrees. The scarcity of grain for food is daily getting worse, and unless good rains continue, something will have to be done, as money is getting exhausted, and although a large number of men are away working, the supply of cash for the purchase of grain cannot be kept up. Mealies are 40s. per

muid. The Natal border being closed against cattle, the Natives cannot get any market there. This is a great drawback. Planting still continues, and the rain which fell on the 28th and 30th instant has done no end of good. Several swarms of locusts have been reported, mostly in the Low Country towards the Tugela. Rinderpest still exists in the Wards of Sitshitshili, Ndube, and Mskubalo. Mr. J. R. Cooper,

Stock Inspector, in company with Mr. T. W. Cooper, Inoculator, are doing good work, and I do not think it will be long before the Division is quite free. The total number of deaths from rinderpest during the month was 21 head. No deaths from horse sickness were reported. The health of the Division has been good.

C. C. FOXON, Magistrate.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write :—

At last we have with pleasure to report that rain has fallen throughout the Colony, and not only have our white farmers been able to plough, but we are assured that Natives spent the "King's Birthday" in turning over the soil. Trade shows but little improvement; but one hopes, with favourable weather, to hear of our commerce making a fresh start.

Mealies.—Parcels of Natal mealies have changed hands during the last fortnight, and four times during that period small lots have been disposed of on the Market, at prices varying between 7s. 2d. and 15s. per 100 lbs. American mealies are now coming forward in large quantities, and the prices in Durban are between 14s. 6d. and 16s. per muid.

Onions.—The market is well supplied and prices have been everything between 6s. 3d. and 16s. 6d. per 100 lbs.

Eggs.—Market well supplied for time of the year. The lowest realised being 1s. 3d., the highest 2s. 2d. per dozen.

Butter.—From 1s. to 2s. 1d. per lb.

Poultry.—Common fowls from 1s. 10d. to 4s. each; geese, from 5s. to 9s. each; ducks 5s. 6d. to 8s. per pair; turkeys (cocks) 10s. to 20s. each, (hens) 7s. 6d. to 10s. 3d. each.

Vegetables.—Good supplies of the following constantly sold, viz.:—Beans, beetroot, cabbages, carrots, celery, cucumbers, eschalots, lettuces, marrows, onions, peas, parsley, parsnips, radishes, rhubarb, spinach, tomatoes and turnips.

Fruit.—Very scarce and very little offering; the chief varieties being apples (custard), bananas, lemons, limes, naartjes, oranges, plantains, pineapples and papaws.

Hay.—Large quantities are still coming forward; and, notwithstanding the long dry season, the market has never been better supplied during October for a number of years. Prices vary between 1s. 3d. and 4s. 5d. per 100 lbs. Bedding, as usual, according to size of load; the largest being 9s. up to 22s. per load.

Forage.—Market is well supplied, and prices have varied between 4s. and 8s. 3d. per 100 lbs.

Potatoes.—New potatoes are now being offered almost every morning; but while some samples only realised 7s. 3d. per 100 lbs, others realised

23s. 6d. and 24s. 6d. per 100 lbs. Sweet potatoes, 7s. 3d. per sack.

Mabele.—Only imported now offering.

Beans.—From 23s. 3d. to 24s. 6d. per 100 lbs.

Tobacco.—Only a few samples offered, and these realised 10d. per lb.

Sundries.—Under this head the market is not well supplied at present. Bacon 6d. per lb.; mutton, 4d. to 10d. per lb.; pork, 5d. to 7d. per lb.; rabbits, from 6d. to 2s. 6d. each; trussed fowls from 2s. to 3s. 6d. each.

Firewood.—From 7d. to 11½d. per 100 lbs.; cut firewood, 11½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes :—

General.—Business remains bad, and the commercial outlook is thoroughly gloomy.

Mealies.—White North American are quoted at 16s., and South American at 14s. per muid. Stocks of either are not too plentiful, and the demand keeps strong.

Potatoes.—No Colonial are available, and inquiry for imported qualities is good, with rates at about 21s. per bag for best Early Rose.

Forage is in poor demand, and prices nominally 8s. 6d. per 100 lbs.

The recent rains have had the effect of stimulating enquiry for seeds of all kinds. Farmers would do well to buy at once while stocks are available.

JOHANNESBURG—We regret to say that our usual special report has not reached us.

Vice-Admiral Woolcombe mentions in "The Field" an old horse, 34 or 35 years of age, still going strong and sound, and doing useful work. "Charley," he writes, "was bought at St. Mewan, Cornwall, by my brother, the late Rev. G. L. Woolcombe, when rector of that parish, in the middle of 1872 as a four-year-old gelding, so he was probably foaled in April or May, 1868. Charley was driven on country clergyman's work to 1889, when, with my brother, he moved to Hemerdon House, where he was much used, first as one of a pair, and latterly in a small four-wheeler for five or six years. Then the horse went to the Home Farm for light work, which included a weekly journey to Plymouth in a spring cart, seven miles each way; this he still continues to do, and makes nothing of it. The horse is of a most friendly disposition, and has always made his own pace in a very hilly country.

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AND MINING RECORD.

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Cherries.

By T. R. SIM, F.L.S., Conservator of Forests.

THE appearance of several small baskets of cherries in Pietermaritzburg this week surprised even the proverbial oldest inhabitant, and led to the frequent enquiry, "Where did they grow?" Cherries have not, hitherto, been regarded as one of Natal's fruits, for though a good many trees have been planted, the result has usually been a profuse bloom, but no fruit, the crop usually dropping off when the cherries are about half-grown.

The present consignments, which are only small samples of the larger stock where they come from, were grown on the Trappist's farm at Centocow, Dronk Vlei; and in answer to my enquiries, the Father Superior writes as follows under date November 7th, 1903:—

"Dear Sir,—I herewith beg to forward samples of white and black cherries grown in our nursery at Centocow, M.S., Dronk Vlei. The white kind is 'Elton Heart,' the black 'Bedford Early Prolific,' and the one you got samples from on 4th inst. was 'Schmidt's

Early.' I also forward three branches of Bedford's Early Prolific, to show how the fruit sets on the trees. We have many different kinds of cherries in our nurseries, but I am sorry to say only a few trees, say 80 or 100, will be available for sale in July next. We make it our rule not to present trees for sale concerning which we are not quite sure that they can be relied upon as good bearers, but as cherries have now, this year, proved that after all they can be brought to bear satisfactorily even here in Natal, we shall start propagating them for sale in future. The 80 or 100 grafted trees we now have were meant for our own use, but I shall be ready to sell them to the public now should any purchaser turn up. Part of the cherry trees, now bearing, are big standard trees which were supplied to us from Pietermaritzburg in 1880, and planted then; others are bush-trees and were imported in 1891 from Germany. All these trees,—standard and bush alike,—have fruited every season for the last 3 or 4 years, but the only crop worth mention was got this year. In other seasons the trees came into bloom, but almost invariably dropped most of the fruit when as big as peas. We made all imaginable trials and experiments to prevent the trees dropping their fruit. We brought the water directly under the trees, and had it running there day and night, without achieving much beneficial result; then we had it run only for such a time as was sufficient to thoroughly saturate the soil, then turned it off, and on again when the soil began to get dried up; then we ringed the trees in order to prevent the sap from going down again. This season we also had them ringed, but I am inclined to think that it is not so much this ringing operation that brought on the good crop as that the weather and season in general was favourable to cherries this year. Then, we must not lose sight of a point which is usually overlooked, viz., that the trees are often expected to bear fruit earlier than they naturally do bear. I know of instances where growers have thrown away trees as useless, and blamed the nurseryman for supplying useless stuff, and robbing the public because the trees did not bear fruit in the second year. One does not think that a tree must have reasonable time to come to maturity, and that that time is at least five or six, or even more, years after the time of purchase, according to the kind of tree. Seeing things thrive and go on at a gallop-pace as they do in this splendid climate of ours we are all only too prone to look at things generally, and trees particularly through 'smoked' spectacles, rather than allow them the time they really need to come to bearing age. A few years will now show whether or not we will be able to have this splendid and delicious fruit regularly in this our prosperous and promising Colony.

The frost, I am glad to say, never did any damage to the cherries.

One cherry, the 'Morello' stands first among all. This kind which ripens toward Christmas has had plenty of fruit yearly for three or four years.

Will you please let me know how the three different samples arrived. The loose cherries were picked on Friday, November 8th, in the afternoon; the branches were cut off the trees on Saturday, about 10 a.m., and all sent away by post on Saturday, November 9th.

The fruit was received on Tuesday in splendid condition, better, indeed, than cherries usually arrive in London from France; and three days' carriage, partly by mounted post-runner, partly by post-cart, and partly by rail, is a sufficiently trying ordeal for tender fruit. The photographs reproduced here were taken after this journey. When cherry marketing becomes an industry in Natal, and the railway arrives at Donnybrook or Riverside, 1 lb. punnets packed in crates of 36 or 48 punnets will carry cherries in good marketable condition to Durban or Johannesburg from Centocow or anywhere in that neighbourhood.

The difficulties enumerated by Father Reiner are, however, only a repetition of those which have been experienced wherever cherries have been grown. The cherry is distinctly fastidious, and sulks more readily than any other cultivated fruit. It flowers very early in the season, and the crop is often lost, through frost or cold affecting the flowers while open. Cold frequently causes the fertilization to be weak, so that although the cherry forms, the effort of producing the stone is too severe, and the fruit falls immature. But this dropping of the fruit before it is ripe may also occur through other causes. Too much or too little root moisture has that effect, consequently selection of soil is of first importance. A light sandy soil of considerable depth, and not apt to dry out, suits it best; and such a soil on a gentle slope is better than a bottom-land where occasional saturation for weeks may occur. Rock underlying at a few feet depth is to be avoided, as also stiff retentive clays. In Kent, which has always been regarded as the home of the cherry in England, it is grown on deep loam, overlying rock at considerable depth; and in Flanders, whence cherries





CHERRIES GROWN AT CENTOCOW, DRONK VLEI.

are shipped in quantity, the soil is merely a soft dark-coloured sand; while in California best results have been obtained in light sandy soil of great depth. But the depth is required more to ensure moisture without saturation than because the roots go deep, for the cherry, is naturally a surface-rooter, and responds well to having the surface of the soil mulched with straw or rough manure in order to keep the surface moist. On the other hand, sand or gravel which dries out is unsuitable, for though the trees thrive at first, they usually die while still young.

California includes the cherry as one of her large fruit exports, and summing up its cultivation there Wickson states:—

"These facts show that the cherry must have enough water or it will not succeed. On the other hand there must not be excessive moisture in the soil either from irrigation or by moisture. Cherry trees in southern California, planted with orange trees and given similar irrigation, have failed utterly. Planting on naturally moist land in low places has also failed, and observed facts some time ago led to the conclusion that at the south the cherry should be planted on well-drained land which could be irrigated (as the behaviour of the tree indicates its need of water), rather than on naturally moist land because of the likelihood of excessive moisture in such situations. More recent experience has declared mellow, well drained soils of the higher lands well adapted to the cherry, and on such soils, when well cultivated, cherries have done well without irrigation at Pasadena, Pomona, and elsewhere. The commercial cherry product of southern California comes, however, from mountain valleys and high plateaux. In California, as elsewhere, the Dukes and Morellos may succeed where the Hearts and Bigarreux fail. The May Duke seems especially hardy, and bears well in Nevada, where other sorts fail utterly."

The cherry is rather a temperate than a sub-tropical fruit. In Europe it does best in the south of England and north of France; the import into England being over 200,000 bushels, valued for import returns at about ten shillings a bushel. Muller states:—

"It is hardly in Norway in latitude 66deg. 30mins., and bears fruit in latitude 63deg. 30mins. In the Himalayas it is cultivated up to 12,000ft. In the Colony of Victoria it will bear fruit at an elevation of 5,000ft."

In Cape Colony it has often been disappointing, probably mostly on account of soil conditions not being

studied, but it does better in the higher districts than coastward, where it is too apt to come into flower before winter is past. In Natal the districts where success may be expected are within the yellow-wood belt (i.e., where Black Wattle does best), and along the lower slopes of the Drakensberg. The intermediate district from Mooi River to Newcastle, as well as the coastward district, is less likely to be successful. Even in the localities mentioned, selection of site so as to secure suitable soil, and freedom from cold cutting winds are absolutely necessary, and it is advisable in every case to plant more than one kind, as some of the kinds are not fully self-fertile, and require to be fertilized by pollen from another kind of cherry growing near. In the *Transvaal Agricultural Journal* for October, 1903, Mr. R. A. Davis, Horticultural Expert, writing on "The Fruit-growing Districts of the Transvaal," states:—

"Perhaps the most conspicuously successful amongst the fruit trees already growing here is the cherry, which attains a large size, and presents a thoroughly healthy appearance. Gummy, one of the most inveterate enemies of this tree is not apparent; neither does there appear to be any traces of its ever having been present, or any sign of its advent in the future. With the introduction of better varieties there is no doubt but that a good business in this fruit might be developed. To anyone not acquainted with the immense volume of trade done in some countries in this one particular line, it may seem an exaggeration to say that hundreds of car loads of cherries, each containing some 12 tons of 2,000lbs. each, are annually sent from the West to the Eastern States of America, yet such is the case, and, in addition, an equal or possibly larger quantity is consumed by the "canaries." With production on such a colossal scale as an example, it should be possible to attempt, at any rate a beginning, and it may be stated that financial success in this line is about as sure, or perhaps more sure, than in any other."

But as has been the experience in Natal and Cape Colony financial success with cherries is sometimes somewhat tardy. Perhaps no fruit yields a heavier return per tree when once in good bearing. I have records of Californian trees from 30 to 40 years old which each bear from one to one-and-a-half tons of fruit annually and regularly. And, with

reference to young trees, in the report on Field Experiments in Victoria, 1887-1900, records on the effect of manures applied for eight years at Doncaster, Victoria, to 18 plots of cherries, show on the average a return of over 20 tons per acre for the eight years ($2\frac{1}{2}$ tons per acre per annum), while some of the plots show nearly six tons per acre for certain years, though the effect of manure appears to be less regularly evident with cherries than with some other fruits. But heavy crops of cherries should not be expected during the first few years of growth; such precocity is not natural to the cherry. On this subject Wickson very pertinently remarks:—

"Though the cherry in favourable situations bears early, the grower, especially on strong rich lands, will often have many years of disappointment from falling blossoms and fruit. During this time the trees will be making marvellous wood growth, and this apparently suppresses the fruiting function. Usually these trees will ultimately bear when their exuberant growth declines. They can be thrown into fruit sooner by root-pruning, digging a trench around about 8ft. from the

tree, and severing the roots thus encountered, or by summer pruning of twig ends. Because of this overgrowth, growers give such soil to the apple or the pear rather than the cherry. Sometimes the non-bearing of the cherry is inexplicable. Though everything seems to be right, and the blooms are profuse, the fruit will not stick. Some think it is due to lack of association of different varieties and cross fertilisation. It is held in Vacaville that keeping bees in the vicinity of cherry orchards has increased the bearing."

Cherries are usually grafted on cherry stocks, but these should be seedlings rather than suckers, for suckers are apt to sucker again, and even seedlings of some kinds do so though others do not. They may be grown as high standards or trained to low bush trees. The latter form is the best for most white and red cherries, but Morello's fruit on last year's wood, which is usually left nearly full length and is long and pendent so the standard form suits them better, the pruning then being confined to the removal of bare old wood, and the regulation during summer of how many young shoots can be left.

Passing Notes.

SELLING FARM IMPLEMENTS.—Ergates writes:—"The ignorance of many of those whose business is the sale of farm implements, in the practical use of the implements, is remarkable. Indeed, even in the putting together, mistakes are by no means infrequent. It is, however, in the manipulation that the ignorance is most striking, and that ignorance has been widely exhibited of late in the exhibition of case ploughs. Many more of these ploughs would, I am convinced, have been sold when they were being introduced to the farming community had the demonstrators in charge been better qualified for the duties undertaken. In one instance I know of, the purchaser could get no information as to how to deepen the cut of the discs, or how to work the machine on a hillside. The material and the construction of his plough were good, and while the plough was being worked on the flat ... was satisfactory. When, however, it was taken to a hillside the disc would

not enter the soil. After a good deal of experimenting the purchaser found that the control lay in the back wheel. This wheel is attached to a strong rod or lever, which runs in a sort of what might be called a bridle. On the flat land this after wheel had been running loose, and the work more than met expectations, but until the wheel was firmly fixed in the bridle no work could be done on sloping ground. Manufacturers should provide for the ignorance of agents by supplying with each implement full instructions for its use—instructions such as are given to the buyers of sewing machines. Mr. Birchenough, the Imperial Trade Commissioner, recommends that manufacturers of machinery should personally visit South Africa for studying the requirements peculiar to the country. This is excellent advice to those for whose interests he writes. As a Colonist, I would suggest to local firms importing or acting as agents for farm implements to

make it a point of having one of the firm if possible, and if not one of the staff, well grounded, by practical farm experience, in the handling of farm implements."

BARK FOR AUSTRALIA.—The letter from Mr. Geo. Wilcox to the Minister of Agriculture, which is published in this issue, will, we imagine, be read with some astonishment. "Bark for Australia" sounds to English ears much as "Coals for Newcastle." Mr. H. von Buelow in his address to the Association of which he is President, says that greater competition from Australia is to be expected by our wattle growers, and here is an application for bark from Australia! Answers to Mr. Wilcox will cost but little, and may lead to a new market. The freight should be low, for the ships bringing produce can find but little, if any, back freight from South Africa. In the event of correspondents not knowing the meaning of "c. i. f." we give the translation:—cost, insurance and freight."

DISTRICT EXPULSION OF BAD NATIVES.—Mr. Skottowe in his interesting contribution to our District Notes' column, says that members of the Farmers' Association of his district have entered into an agreement not to take as tenants kraals turned off neighbours' farms for misconduct. This, so to say, self-denial ordinance of the Association is indicative of a high sense of public duty, and is deserving of warm approval, and, above all, of imitation. Were other Associations to follow the lead given by the Mooi River Farmers' Association, thieving of stock or produce would be much lessened. Natives have the greatest aversion to expulsion from the districts in which they reside, and the fear of kraal expulsion would probably be a greater deterrent to crime than the usual fines and imprisonment. Again, in a new district it is to be presumed that for a considerable time the stranger would be confronted with difficulties he did not experience where he was one of the local community. Of course the objectors will advance the argument of "What's the good when all do not act likewise, and when thieving natives can always go on to the land held

by absentees and companies?" We imagine that the following reply would be suitable:—"The direct good of Associations of farmers agreeing not to accept as tenants kraals which have been involved in proved misconduct would be great and immediate, and further, this exercise of self-denial would make all feel so virtuously indignant upon the subject of taking bad natives as tenants, that legislation with regard to the practice of the errant absentees and companies would be speedy forthcoming." As matters stand at present there can be no hope for the creation of that force of public opinion necessary for such legislation.

POTATO SEED.—We are pleased to hear from various sources that the potato seed being supplied by Messrs. Sutton and Sons to the Colony is no longer characterised by the disadvantage of being altogether too large in size. Readers of the *Journal* will remember the steps we took in this matter. A copy of the number containing the interview of Ergates with Mr. J. L. Kershaw was sent to Messrs. Sutton & Sons. Mr. Kershaw spoke in the interview with much emphasis upon the unnecessary size, and, in consequence, unnecessary cost of the tubers exported for seed. Messrs. Sutton's reply to our covering letter will be found in Vol. V. page 106. Upon two or three points in potato culture Messrs. Sutton express opinions, and it is almost needless to add that everything they say on the subject of potato culture is authoritative in the highest degree.

PRICES OF PRODUCE.—The annual report of the President of the Noodsberg Agricultural Association (Mr. H. von Buelow), will be found well worth perusal. In two or three matters, and especially in the commercial aspects of agriculture in the Colony, he breaks new ground.

TO MAKE THE MOST OF A COW.—The article we print elsewhere deserves the attention of all dairy farmers. The article gives the gist of an American agricultural pamphlet on the results of investigations into a new system of milking in Denmark. The difficulties connected with ordinary milking in this country are

great, but many of them, by care and patient supervision, are gradually being overcome. The yelling of milkers, and whacking of cows with sticks formerly common in kraals at milking time, are now to be observed only rarely. Such strides have been made in this respect that in some instances it may be hoped that the method advocated may be given a trial. There are, unfortunately, but comparatively few who have practical

knowledge of milking in the Colony, but we imagine that there should be but little difficulty in teaching the process now in vogue in Denmark to any intelligent native or coolie milker. The gain is said to be great—the gaining of nearly another tenth in butter fat; the gaining of the equivalent of nearly a another cow for every nine of one's troop. Neither must it be forgotten that in developing the milking qualities of a cow that that improvement goes on to the cow's progeny.

Lion's River Agricultural Society.

PRESIDENT'S ANNUAL REPORT.

WE extract the following from the Annual Report of the President (Mr. John C. Parker), of the Lion's River Agricultural Society:—

The agricultural state of the district is not up to the standard of bygone years, owing to the want of rain and the frosts last March, which destroyed many acres of mealies and kafir corn. During the present spring some crops of potatoes, planted early, have never come up, and others although they started growing, have since withered away.

To the breeders of thoroughbred horses it must be a source of satisfaction to have such a fine selection of stallions to choose from as there is in the Colony at the present time; notably, Ciamond, Energetic, Arcano, Old Fuss, Border Chief, Porridge, Purdah, and Petrero. As time goes on the number of mares worthy to match such horses is slowly being added to.

Those who are interested in breeding cart horses may see something worthy of notice by visiting the farms of Mr. H. Blaker and Mr. W. Woods.

Amongst the minor plagues the war left behind mange was one of the most annoying. Happily little of it is to be seen now.

The present season seems to be a good lambing one, and the division is almost clean as regards scab. Cattle have had a very severe winter to contend with, the

long continued drought having killed some and reduced the majority to a very low condition. The most serious thing that stock-owners have to face in the future is the coming fight with Rhodesian redwater. Before you on the table will be found a notice to stock-owners issued by the Minister of Agriculture, in which is stated the terms on which Government is prepared to lend money for the purpose of erecting dipping tanks. The precautions already taken, and proposed by the Government have been endorsed by the Farmers' Conference, and if they are faithfully carried out will leave little to be amended. Dipping tanks have been in operation in various parts of the Colony for two or three months, and a working mouel may be seen at the office of the Minister of Agriculture. The disease is evidently travelling slowly. It has been close to the border of the Colony for some months without crossing it. The latter fact may be accounted for by the energetic action taken by the Government, and the former may enable us to take a less gloomy view of the situation than was taken a couple of months ago.

On resigning the office of President, I have to thank the Hon. Secretary and Treasurer and members of the Committee for the work they have done during the past twelve months, and to wish you all good health and prosperity.

To Make the Most of a Cow.

MENTION has already been made of a bulletin, says the *Live Stock Journal*, entitled "Investigations of Methods of Milking," which was sent out by the Agricultural Experiment Station of the University of Wisconsin. Some amount of interest has consequently been roused, and to meet the demand for information the following notes have been prepared. The bulletin itself is a closely-printed eight-page pamphlet, with many tables of results that are of particular interest to the student of detail and the lover of comparative statistics. The more important matter can, however, be given in brief compass.

Mr. F. W. Woll, who is chemist at the Experiment Station, is the writer of the bulletin. In the conduct of the preliminary experiment in the University Dairy Herd he was assisted by Mr. W. L. Carlyle, Professor of Animal Husbandry; while for the second experiment in this herd, and subsequently in the experiments made at twelve farms in various parts of the State, the sampling and testing are undertaken by Mr. R. B. Harris, one of the Station's "Supervisors of Dairy Tests." These personal notes are given because it is of the first importance in such matters to know that there have been used the services of men who are wholly to be depended on for accuracy and honesty of record. Seeing that Mr. Henry is Director of the Station and Mr. Badcock the Assistant Director and chief chemist, two men of European as well as American repute, no further guarantee can possibly be demanded for the utmost exactitude in the records and the statement of results.

The Americans are much more keen after information regarding dairy work than are our countrymen, else we should not have had to await the issue of such a bulletin to learn all about the ideas that have for some time been put forward in two Danish dairy schools. Mr. Woll went to Denmark from Wisconsin in the autumn of 1901, and then learned the details of the plan systematised by Dr. J. Hegelund at the Ladelund Dairy School, and that taught at another school by Chr. Soendergaard. He came to the con-

clusion that the Hegelund method was the more likely to give maximum results, and it was accordingly on this system that the Wisconsin experiments were conducted from June 4th, 1902. Here is what Mr. Woll says of

THE METHOD.

"The new method of milking consists in following up ordinary rapid and thorough milking by a set of manipulations of the udder which will bring down the last traces of milk contained therein. By a few manipulations of the udder this residual milk may readily be brought down in a couple of minutes' time, and more milk will, as a rule, be obtained in this way than is possible by the ordinary stripping method. Since the milk thus secured is very rich, being of the same character and composition as 'strippings,' the amount of additional butter fat obtained is considerably greater than might be supposed from the quantity of milk brought down." So much for the result. How is it obtained, and what are "manipulations"?

THE THREE MANIPULATIONS.

First Manipulation.—The right quarters of the udder are pressed against each other with the left hand on the hind quarter, and the right hand in front of the fore-quarter, the thumbs being placed on the outside of the udder, and the four fingers in the division between the two halves of the udder. The hands are now pressed towards each other, and at the same time lifted towards the body of the cow. This pressing and lifting is repeated three times, the milk collected in the milk cistern is then milked out, and the manipulation repeated until no more milk is obtained in this way, when the left quarters are treated in the same manner. If the udder is very large only one quarter at a time is taken.

Second Manipulation.—The glands are pressed together from the side. The forequarters are milked each by itself by placing one hand, with the fingers spread, on the outside of the quarter and the

other hand in the division between the right and left forequarters. The hands are pressed against each other, and the teat then milked. When no more milk is obtained by this one manipulation, the hindquarters are milked by placing a hand on the outside of each quarter, with fingers spread and turned upward, but with the thumb just in front of the hindquarter. The hands are lifted and grasp into the gland from behind and from the side, after which they are lowered to draw the milk. The manipulation is repeated until no more milk is obtained.

Udder Manipulation.—The fore teats are grasped with partly-closed hands and lifted with a push towards the body of the cow, both at the same time, by which method the glands are pressed between the hands and the body. The milk is drawn after each of the three pushes. When the fore teats are emptied, the hind teats are milked in the same manner.

In the university herd twenty-four cows being tested the average daily milk yield was thus increased by 4.5 per cent., and the butter-fat by 9.2 per cent. the trial time being five weeks. The average daily gain in milk was 1 lb., and of butter-fat .09 lb. per head. In the twelve Wisconsin farm and dairy herds the daily average increase of milk yield was 1.08 lbs. and .1 lb. of butter-fat.

THE REASON WHY.

To explain why there is such an increase—an increase that is independent of breed, but the amount of which would seem to depend largely on the nerve condition or the temperament of the cow—the bulletin pictures a section of a cow's udder. The interior of the udder may be said to be very like the interior of the familiar muffin or crumpet—it is made up of a spongy, more or less fibrous mass termed milk glands, of which there are two lying side by side, each with its outlet, which we speak of as the teat. There are many more but much fuller ducts and cavities. "When the milking begins the milk flows readily from the finer milk glands into the ducts, and as these come together into larger trunks the particles are united into drops of milk visible to the naked eye." The

"strippings" are the product of the last portion of the milk-producing operation in which the sack-like cavities, known as *alveoli*, have been active for the milking. Milk-making is believed to be most active when the milk is being drawn from the udder. The "stripping" is the richer portion of the milk adhering to the cavities and ducts of the udder. The three manipulations above described press out the last and best of these portions of the natural product—those which are the richest in fat and other milk solids. The operation is, in short, very like squeezing very hard a fine sponge to exhaust it of water or other contained liquid. A look at a drawing of a section of a cow's udder enables one to see at a glance that this is what the Hegelund method ensures. To leave this fatty matter in the udder does the cow no good; it rather lessens her future powers of milk production. Further, careful exhaustive milking is an important factor in preventing diseases of the udder, and especially lessens the chance of inflammation of that important organ.

RESULTS.

The 142 cows experimented on for the purposes of this bulletin included Jerseys and Guernseys—the two special dairy varieties and grades therefrom, graded Shorthorns, Holsteins and their grades, and graded Red Polled. There was found in each variety a great diversity in the readiness to yield milk, and consequently a great diversity in the percentage of added butter-fat obtained by manipulation of the udder. The testing of the method with the twenty-four cows drawn from the University herd was thoroughly done; so as to determine what effect, if any, the exhaustive milking had on the total milk and butter-fat yield in following equal periods when there was no manipulation of the udder. Each of the twenty-four cows was also previously tested from 4th to 11th June continuously. Only a few of the results may be quoted in this brief account of the experiment, and these are the best of the records for some one week of the testing time (but not necessarily the same week in every case). The last column shows the percentage of butter-fat in the first week's milk.

Breed, Age (year), Name.	Days in Milk.	Regu- lar.		Exhaustive Results.		Butter per cent.
		Milk.	Fat.	Milk.	Fat.	
		lbs.	lbs.	lbs.	lbs.	
Jersey (10), Gold ...	277	160.1	9.75	167.45	10.43	6.3
Cr. Jersey (5), Reba ...	112	198.2	9.36	201.5	10.16	5.0
Guernsey (2), Mary ...	139	76.3	3.24	89.35	4.36	4.8
Gr. Guernsey (7), Dora ...	157	176.0	8.59	179.4	8.91	4.9
G. Shorthorn (8), Maud ...	199	249.9	9.30	254.1	9.55	3.7
Holstein (6), Chloe ...	277	225.6	7.47	235.55	8.19	3.3
Gr. Holstein (5), McGeech ...	119	366.9	12.60	373.85	13.10	3.0
Gr. Red Polled (6), Lady ...	314	174.3	7.09	182.3	7.87	3.9

The last-named cow, Lady, calved down early in October. A note sent to her breeder, Mr. J. W. Martin, on November 10th, when udder manipulation would be giving its full results, reads as follows:—"The Red Polled cow, Lady, has just finished a week's record, in which she has given us 17 lbs. of butter; she has given as high as 60 lbs. of milk in a single day. Wish that I might have a pure-bred or two like her." In Norfolk 14 lbs. to 15 lbs. of butter from a cow so bred is considered excellent; the excess may be held to be in part due to the Hegelund method of milking.

The tabulated details of the tests made at the farms give for twelve Jerseys in one herd a day's average of 31.75 lbs. of milk and 1.65 lbs. of fat, of which .55 lbs. of milk and .07 lbs. of fat were due to the manipulation; percentage of fat 5.20 lbs.

Guernseys (a herd of eleven): Day's average of milk 23.85 lbs., and 1.18 lbs. of fat, of which .75 lbs. of milk and .09 lbs. of fat due to the manipulation. There was a second, but not so good a Guernsey herd. The remaining nine herds were graded as cows of unknown breeding on the dam's side.

Mr. Woll holds that the experiments have demonstrated that the use of the Hegelund method of stripping improves the quality of the milk by the addition of the added godly percentage of fat; that very few of the cows in any way objected to the manipulation—the third part of the method was not liked by the few cows that were of a nervous temperament; that taking a long period as the test, there is no lessening of their richer milk products. The milk glands of the cows are after a short while able to adjust themselves to the thorough emptying of the udder, and are stimulated thereby to increased production. That at first the manipulation will take at least four or five minutes, but when the milker has become familiar with them they will be done in less than two minutes, while the time now devoted to stripping will be saved.

As to the time required to learn the method: In Denmark there are practical six-day courses, and experience shows that the small cow owners who look after their personal interests take to it readily. Mr. Woll gives this caution:—"The manipulations should be done lightly, so as to cause no irritation to the cow, or waste of energy on part of the milker. It requires but very light manipulations to bring down the residual milk in the udder nearly as completely as is possible by making a hard task of the manipulations." Working out the money results, Mr. Woll says:—"If butter-fat is worth 25 cents, a pound (that is to say if butter is making 11d. per pound), the value of the increased yield would be 50 cents, that is, there would be a gain of 20 cents a day per twenty cows, or about 60 dollars a year with cows in milk 300 days, as the direct and immediate gain from practising the manipulation method. There is also the ulterior gain of improving the milk and fat production tendency in the offspring of the cow, and that is what every breeder of cows has to aim after, whether his cows be specialised or be dual-purpose animals.

The full title of the Bulletin is:—"University of Wisconsin Agricultural Experiment Station, Bulletin No. 96, Investigations of Methods of Milking." Madison, Wisconsin.

No "Luck" in Dairying.

PROFESSOR ROBERTSON, Commissioner of Agriculture of Ontario, Canada, says it would hasten the fortune of many a dairyman if he could get it out of his head that there is no such a thing in the business as "good luck." Everything is the result of good calculations, and good energy in seeing that close calculations are carried out. There may be bad luck. Bad fortune may come by accident, but good fortune never. The old saying, "Everything comes to him who waits," is not true. Everything waits for him who comes. It is the coming quality in the man—the "get there" quality—that tells. You cannot make a good dairy paper on the basis of "luck." It is made by good judgment, accurate knowledge and constant push. You cannot construct a cow through the processes of dairy breeding by relying on "luck." You must work for it, do everything for it you know how except to sit back and rely on luck.

It seems almost an act of foolishness to say these things, yet I must confess that the men who keep cows in this country are, of all men I ever met, the most given to trusting in "luck." Ninety-nine out of every hundred cows born into this great dairy field, where brains ought to command, have nothing behind them in their breeding but a trust in "good luck." These cows show clearly what was the judgment and knowledge of the men who bred them. Go to any man's herd of cows, where good dairy judgment and calculation have graded them up out of the cows that have nothing but a trust in luck for pedigree and you can see the difference at once between good sense and "luck."

I visited once a herd of Jersey cows owned by Adam Stevens at Ellensburg, Wash. The growth that man has made in trusting to good dairy knowledge, not luck, tells the story. He was a range cattle man, pure and simple. It was a good cow on the range that would yield 125 pounds of butter a year. By accident a dairy paper, sample copy, was sent him. He threw it aside. Then another copy came, and he served it the same way;

then the third. He stopped to read that. Something met his eye that challenged his attention. It set him to thinking. "Is it possible," he said to himself, "that I really do not understand a dairy cow? I wonder if I had not better look into the matter?" He subscribed for that paper. That put him at once into the society of men who did not know about the dairy cow. He read what they had to say about their experience and their judgment. He started with seven poor range cows, and a registered Jersey bull at the head. His neighbours sneered and jeered at him. To-day he has one of the finest money-making herds I know of in the United States. How did he do it? Simply in this way. He quit the society of the sneerers and jeerers. He commenced to read and think; he commenced to act in obedience to dairy sense. He was a man who paid no attention to luck, but put good thinking into action. Now he is one of the most prosperous dairy-men I know of. He has done these things on a wild sage farm, where he had to irrigate to grow crops. He had not the advantage of a bright lot of dairy farmers about him to whom he could turn to for advice. Yet right in the oldest dairy districts can be found men by the hundreds who are practical failures as dairymen. They are filled with their own conceit. No one can teach them a better way. They are handling cows on old, worn-out notions that do not fit these times, and that bring them no profit. Their farms are growing poorer every day. Prices for dairy products are growing less, and they are getting less revenue every day. Yet out in the sage wilderness is a man who is a success, while they are failures. Can these men not see that their ideas and their practices are wrong? Can they not see that there is no profit in the way they are thinking and doing?

A Government measure provides that manufacturers of fertilisers must register their brands before offering them for sale in New Zealand. Vendors must also be registered, and a description of the fertiliser must be attached to each package.

Veterinary Departmental Reports for October, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE to report as follows for the month of October, 1903 :—

Scab.—Twenty-eight outbreaks have occurred during the month. Klip River County, 14 ; Weenen County, 1 ; Umvoti County, 2 ; Polela Division, 2 ; Impendhle Division, 1 ; Ixopo Division, 1 ; Utrecht Division, 4 ; Vryheid Division, 3.

Lungsickness.—Five fresh outbreaks have occurred during the month. Newcastle, 1 ; Umlazi, 1 ; and Vryheid, 3.

Anthrax.—Five deaths reported—2 in Klip River and 3 in Umvoti County.

Glanders.—Five clinical cases have been destroyed during the month, and one which reacted to Mallein.

Quarter-civil.—42 deaths reported—22 in Umvoti County, 13 on the coast, 5 in Lion's River, and 2 in Umgeni Division.

Vegetable Poisoning.—133 deaths amongst cattle reported. 10 in Klip River County ; 45 Lion's River ; 3 Impendhle ; 40 Umvoti ; 19 Ixopo ; 12 on coast, and 4 in Weenen County.

Redwater.—16 deaths reported.

Gallsickness.—60 deaths reported.

Rinderpest.—This disease exists in the Districts of Eshowe, Umlalazi, Mahlabatini, Nkandhla, and Entonjaneni, in Zululand, and the Babanango District, Vryheid Division.

African Coast Fever.—At the end of the month no sick animals existed at Ingwavuma. The dressing for ticks is being maintained, and it is hoped that in course of time the infection here will be starved out. It is anticipated that, while cattle remain on this infected veld, further cases may occur, as even with constant dressing for ticks a few may obtain a hold on the animals and infect them during the interval between dipping. Animals susceptible to the disease have now been running on infected veld at Ingwavuma for several months, during which time it is reasonable to suppose they should all have by

this time acquired the infection, but as this has not been so, it would appear that the constant dressing for ticks has been the means of preventing the several animals which still exist there from becoming infected.

Enquiries have been made regarding the advisability of working or travelling cattle immediately after dipping. With the present dipping agents used it has been found to be inadvisable to work oxen within three or four days after dipping, or to travel cattle long distances. We are inclined to attribute the ill-effects from such a course to the tar properties contained in the dip. In some animals the active principles of tar appear to produce a modified form of poisoning (by absorption through the skin) causing the animal to show symptoms of fatigue and sunstroke. We are experimenting in this matter, and hope to obtain more information at an early date, and when we have more dips to work with. In the dip which has just been completed at Charlestown, only half the usual quantity of tar is being used, but it is too early at present to give results.

You will observe the considerable number of deaths from Vegetable Poisoning. This is not surprising considering the drought and consequent scarcity of food. I am inclined to attribute this also as the chief cause of the number of cases of abortion which have been reported. Contagious abortion does not exist in Natal, as some farmers appear to think, judging from their remarks in the *Agricultural Journal*, and there is, therefore, no necessity to change bulls in troops in which abortion has occurred. Bulls do not carry contagious abortion, such as exists in England.

I put up herewith reports of the D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT,

P.V. Surgeon.

13th November, 1903.

MARITZBURG.—D.V.S. HARBER.

Scab.—There have been no fresh outbreaks of sheep scab this month; several licenses have been raised, leaving two flocks under quarantine.

Glanders.—I destroyed one case of glanders, and tested an in-contact animal, with a negative result.

Mange in horses is still common. Infection with this disease readily takes place from infected stables or studs, and owners would do well to recognise the necessity of treating such places as well as the animals. Three deaths have taken place from this disease this month. A small herd of goats is affected with this affection at the lower end of the town.

General.—One case of tetanus occurred. The serum treatment was adopted, and a recovery took place. Infection in all probability took place from a wound just above one of the hind fetlocks. A most uncommon case of lameness occurred in a horse. He was reported as lame one day; the next he fell down, and made several ineffectual attempts to rise. On examination it was found that the tendons at the point of the back were torn from their attachment. I destroyed this case as incurable.

It would be a great help, in order to obtain a more or less accurate return of deaths in animals from accident and disease, if owners of stock would inform the stock inspectors in their district of any deaths that may occur, as at the present many take place that the Stock Inspector is unaware of, and therefore he is unable to issue a correct report. I think it would be advisable if a notice were put in the *Agricultural Journal* asking owners if they would help in this way.

LADYSMITH.—D.V.S. O'NEIL.

The past month has been noted for a considerable decrease in the number of deaths amongst live stock throughout the district, which may be accounted for by the recent rains which have brought on the veld considerably, affording the stock plenty of succulent herbage, which is essential for the preservation of health during this time of the year. I have

visited the various divisions of my District during the month, and inspected a number of horses that had been running with others which have been destroyed for Glanders since they left this District some months back. I destroyed one animal for Glanders which was tested with Mallein and kept isolated, the animal giving a doubtful reaction on first test. All the young stock are thriving throughout the district, but there are quite a number of breeding cows in poor condition, which is not inducive to the rearing of young calves.

Scab is on the decrease, as the Stock Inspectors have been paying particular attention to this disease, and the owners are endeavouring to eradicate the same.

Mange amongst horses still exists; a few have succumbed to this disease.

Gallsickness is responsible for several deaths during the month, but several animals recovered on being promptly dosed with Epsom Salts or an infusion of aloes.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness. — Outbreaks — Newcastle, 1, and two licenses renewed. Utrecht, one license renewed.

Sheep Scab.—Outbreaks.—Dundee, 1; Newcastle, 2; Utrecht, 1, and two licenses renewed.

Glanders.—I tested two horses belonging to Mr. Saddler, of Utrecht. One of the animals reacted, and was destroyed. This case had a discharge from the nostril, and the submaxillary gland was enlarged.

Mange in Goats.—There are eight flocks in quarantine for this disease in the Division of Newcastle. The disease is becoming more prevalent each year, especially during the winter months and early spring. The general opinion among farmers is that the disease should be made subject to the same restrictions as the Scab Law, and renewal of licenses charged for on the same scale. Farmers complain that in some instances they have to collect and dip goats belonging to natives residing on their farms, in order to prevent the disease from spreading to

their own Angoras, as the owners themselves will not take the trouble to dress them in a proper manner, and the animals being in quarantine, they are unable to turn them off their farms.

African Coast Fever.—I have nothing further to relate regarding the spread of this disease. So far as I am aware, there are no fresh outbreaks in the Wakkerstroom District, Transvaal. A suspicious outbreak was reported to have occurred among eight Madagascar oxen recently purchased in my district, and taken to the farm Elandshock, Vrede District, O.R.C. One animal died, and I understand another showed a very high temperature, but has since recovered. The owner removed and forwarded to me a small quantity of blood from the sick animal, and which, on being placed under the microscope, I found to contain a number of animal parasites known as Trypanosomes.

INGWAVUMA.—D.V.S. FYRTH.

African Coast Fever.—This disease has been and is still confined to seven kraals in the district, and shows no signs of spreading. The strictest quarantine and isolation are being carried out. The cattle are being regularly dipped, and the infected veld has been burnt. A native, Umkuku, removed 4 head of cattle from Sondyswayo's kraal prior to my arrival here, and on my hearing of this, the cattle were destroyed, the veld burned, and the kraal quarantined against the introduction of any cattle; there are none at the present time at the kraal. This native has been imprisoned, and will not cause any trouble for the next month, at least. At the time of writing there are no sick cattle in the district.

Tsetse Fly.—This pest is very prevalent in the belt extending along the Umkusi River, south of the Ubombo Magistracy, and also along the Pongola River, between that river and the Ubombo Mountain. One death in a horse has come to my notice, but no cattle at present have yet shown signs. The dogs along the Pongola River have died in dozens, and this, I consider, anything but

sad, as the risk of the carrying of infected ticks is greatly reduced.

General.—It has been reported that the Hippo in the pans near Muni are dying from some mysterious disease, and at the request of the R.M. I am proceeding at once to investigate. I will furnish a full report immediately on my return, stating what is, in my opinion, the cause of death.

HOWICK.—D.V.S. WEBB.

Redwater.—I was called in to attend a case of this disease in an imported North Devon bull. The bull had been allowed to remain in Maritzburg for a fortnight, previous to being taken up-country. The disease was apparently contracted there, as he was noticed sick on the journey up. Upon arrival at his destination the temperature stood at 107, and remained at between 107 and 107.6 degrees until I saw him three days after the first symptoms, unfortunately too late to do him any good. In this case the urine was never noticed to be discoloured during life, but at the *post-mortem* examination the bladder was found full of claret-coloured urine. Three other bulls imported at the same time, and treated in exactly the same way, have up to the present remained healthy.

DURBAN.—D.V.S. AMOS.

The importations have been as follows:—

Sheep	....	....	....	592
Horses	...	....	....	271
Mules	....	....	....	224
Cows	.....	....	....	62
Oxen	....	....	....	47
Dogs	.....	....	....	19
Bulls	....	....	....	13
Rabbits	..	....	....	10
Calves	....	....	....	9
				1,247

Of the sheep, 527 came from New Zealand, the remaining 65 came from Madagascar; 252 horses were brought from Argentina, 8 from New Zealand, and 11 from England. The 224 mules came

from Argentina. The cows came chiefly from New Zealand; 2 came from England. The 47 oxen came from Madagascar. The bulls and calves came from New Zealand. The New Zealand shipment of 527 wethers, 60 cows, 9 calves, 13 bulls, 8 horses, and 3 dogs was a very nice one, and the heifers were of a good, useful stamp, half-bred Ayrshires and Shorthorns being the most prominent breed. A good Ayrshire bull was also amongst the bulls. The wethers were only in a fair marketable condition, and compared unfavourably with the Argentine sheep shipments that used to land here.

Horsesickness.—Two cases of blue tongue have been reported to me during the month.

Lungsickness.—Four herds are still under incense, and three animals have died from the disease, and two have died from the result of inoculating.

Glanders.—I found one case of farcy belonging to a Coolie on the Market Square; the animal was destroyed, and *post-mortem* corroborated the diagnosis. I have made out a deposition against the owner, who is to be prosecuted for not reporting the disease, and exposing such an animal for sale. I also destroyed a clinical case of Glanders at Sydenham, and the *post-mortem* examination confirmed the diagnosis. The stables in this instance have been rebuilt under my supervision before I would allow them to be used again.

Tuberculosis.—73 animals have been tested, but none reacted.

Tetanus.—I have heard of one fatal case of Tetanus during the month.

The importations through the port are still small in number, and until the embargoes are removed, the number cannot increase. All ships arriving here from Argentina are examined at the outer anchorage.

During the month I visited the farm of Stock Inspector John Swales at Inanda, with the purpose of seeing some cattle put through his dip that he has put up on his farm. The dip answered well, and is splendidly built. The Indians and natives owning cattle near

this farm are very keen on dipping, and a good number are booked, the charge being 6d. per head.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak.

Lungsickness.—None.

Glanders.—None.

Underpest.—None.

Vegetable Poisoning has caused a large number of deaths among cattle during the month, and will undoubtedly continue to do so until there is a more plentiful supply of grass.

Quarter-evil.—Over twenty deaths from this disease have been reported. It is desirable to be inoculated, both in the spring and autumn, on farms known to be badly infected.

General.—A further case, illustrating the danger of using medicine with which one is not familiar, was brought to my notice during the month. A horse appearing to be constipated, the owner was advised to give it a dose of Croton oil, the quantity recommended being a tea-spoonful. As might be expected, the animal was soon afterwards purging in a most violent manner, and showing great abdominal pain. Fortunately, through the aid of demulcents, anodynes, and stimulants a good recovery was made. Croton oil, although often very useful for cattle in conjunction with other medicines, is not to be recommended for the horse, its action being altogether too violent. A short time ago I reported the disastrous effect of giving Little's Sheep Dip to horses in table-spoonful doses. These cases are recorded with the hope of preventing others from trying similarly dangerous experiments.

IXOPO.—D.V.S. POWER.

Scab and Mange are the only contagious diseases we have to deal with in this district at present, and the latter is giving a good deal of trouble amongst kafir horses. In some locations it has caused a very high mortality during the winter. I am glad to say the Natal Police have brought a number of the offenders before the Resident Magistrate.

at Bulwer, and in all cases fines were imposed. This action has had a good effect, as now we see far more natives dressing their horses.

Vegetable Poisoning.—About twelve cases have cropped up in different parts of the district.

Redwater.—Very few cases, so far, this season.

Quarter-evil.—I have been inoculating lately, but no cases have occurred during the month.

General.—Stock on the whole are looking remarkably well.

MOOI RIVER.—D.V.S. VERNEY.

Sheep Scab.—Outbreaks of this disease have not been quite so numerous this month, and with a plentiful supply of grass Weenen County should soon be fairly free from this too prevalent disease.

Lungsickness.—The quarantine having been raised from the cattle at Weenen leaves the County free of Lungsickness.

Glanders.—During this month another outbreak of this disease occurred at Weenen, and as nearly every case has been in horses bearing the cast military brand, I requested Stock Inspector Ball to collect all the horses in Weenen bearing the cast military brand so that I might inoculate with Mallein all those horses that had only been away from the military twelve months or less. With the suspected glanders horse I inoculated ten horses altogether. The horse showing evidence of clinical symptoms, together with a stable companion, gave typical reactions.

Except for an abnormal amount of vegetable poisoning in cattle on account of the drought, stock have been particularly healthy this month.

VRYHEID.—D.V.S. TYLER.

African Coast Fever.—I am glad to be able to report that as far as these districts are concerned, we have not yet received a visitation of this disease. It is still prevalent over the border, but it is difficult to learn the precise degree to which it exists, as many of the reports one hears

turn out on investigation to be merely rumours which, like the proverbial snow-ball, gather in volume as they are rolled, or told. I heard to-day that the disease had broken out again at a farm in the Transvaal, when the last beast of those previously sick died nearly, if not quite, three months ago.

It is the comparatively slow spread of the disease which leads some farmers to look upon it much less seriously than it deserves. In this case, for instance, I did my utmost to persuade the owner to dip his remaining cattle, which he had shunned to clean veld, but I am afraid with little success, hence the inevitable result. It will greatly facilitate the working of the quarantine regulations when we have got the dips in contemplation erected. That at Paulpietersburg is now in hand, and others at Vryheid, Luneburg, and Ngotsha should be commenced shortly. I have noticed remarks, both in print and out, regarding the desirability of appointing local men as border-guards, and may say in regard thereto that there are only two men on the border of my district who are not local men in every sense of the term, and all have a thorough knowledge of the Dutch and Kafir languages. The two men excepted are excellent guards, and have had a great deal of experience of similar work. I am hoping that a continuance of the late rains will raise the river sufficiently to act as a further barrier to the crossing of stock over the border.

As you are aware, a further point of entry for animals other than cattle has been opened at Luneberg, and with a slight alteration of the restrictions on the movement of cattle from farm to farm in the quarantine area, I think the whole thing will be worked with but little inconvenience to residents therein.

Rinderpest.—Rinderpest still exists at Babanango, and also a small outbreak on the Mkuni River, but the new Act up to now is having excellent results, and I have no doubt will be effectual in stamping out the disease completely in a reasonable time.

Glanders.—Three horses were destroyed by my order as suffering from this disease in the Paulpietersburg district.

Scab.—I regret to say that this disease is very prevalent, particularly amongst native flocks in this district. Many natives, and some white people too, look upon it as something which, like the poor, has always been with us, and treat it with a contempt born of familiarity. Six fresh licenses have been issued during the month.

Lungsickness.—One license has been

raised and three fresh ones issued in Vryheid district, leaving four herds at present under license, whilst in Paulpietersburg district there are two herds affected.

The general health of stock in the district is, all things considered, and especially in view of the prolonged drought, very healthy.

Richmond Road and Camperdown Farmers' Association.

ANNUAL REPORT.

THE Annual General Meeting of the above Association was held on the 6th inst., at Camperdown. The President (Mr. T. Stead, J.P.) read his report, from which the following is taken:—

Gentlemen,—As you are aware, the past year has had its drawbacks. We have experienced the most severe drought on record in this Colony, consequently the crops were a complete failure in most districts. The potato crop, notwithstanding the careful selection of seeds and manure, still suffer severely from blight, and even when we have our usual rainfall, most farmers do not reap more than a third of a good crop. If the area of land planted with potatoes produced a fair crop, the supply would exceed the local demand. It is to be hoped that in the near future some remedy will be discovered to prevent, or cure this disease.

With regard to the forage crops, they are a complete failure, except where irrigated. The Algerian oat, which is now usually sown, requires more moisture than the Cape oat, and I think is often sown too late.

Disc Ploughs.—These ploughs, during the last few months, have excited the interest of most farmers. Two trials of these ploughs have been made at Manderston, under the auspices of this Association, on Mr. Moon's farm. Mr. Moon deserves our warmest thanks for the use of his farm for these trials. These ploughs

do excellent work in hard ground, and enable the farmer to prepare his land before the rainy season sets in, and therefore enables him to sow a larger area of ground and the grubs and other insect pests will be greatly reduced. But these implements are far from being perfect. The most serious defect is the lever not lifting high enough to clear the ground in turning, and it also remains to be seen how they will do their work in wet ground.

African Coast Fever.—After reading Dr. Koch's third report on this disease, we can expect only small success with inoculation, should the tick fever attack our cattle. The best move is to use every effort to prevent it spreading through the Colony, and with the valuable information supplied by our able Veterinary Department, there is now no doubt that ticks are the transmitters of the disease, so now our only safety is to destroy and exterminate them. I had an interview with the Minister of Agriculture, and was very pleased to find that he was taking very great interest in this matter, and making every effort to keep the disease out of the Colony. On the border, near the late outbreak, the boundary is being well fenced, and a large area on this side quarantined. The area is to be supplied with mule transport, which is an excellent idea to keep the tick from spreading. Also, Mr. G. D. Alexander's suggestion for the

Government to erect tanks on the main road, 20 miles apart, is being carried out. I should like to impress on you the importance of having these dipping tanks in every district. You will see by the notices sent by the Minister of Agriculture, that the easy conditions of these loans of money from the Government, make it possible for a group of the poorest farmers to erect these tanks. I would suggest that the Farmers' Associations co-operate, and define certain boundaries, and each association undertake the supervision of their district, to ensure that both Europeans' and natives' cattle were regularly dipped. Farmers who have been dipping their stock inform us that their cattle are much healthier, the death rate lower, and the cows give more milk, and ticks rapidly decrease on their farms. These facts alone are sufficient inducement to erect tanks. The outlay will be a good investment, and I am convinced the ticks are responsible for most of the disease amongst our stock.

The Government are fully alive to the disastrous and ruinous effect the tick fever would have on our cattle, and are doing their part to prevent it. It remains with us now to do ours. Let us do it. It may appear a big order to exterminate the ticks, but I believe by our united efforts, and with constant and regular dipping, it is possible. To prevent the Rhodesian disease I believe is possible, to cure it impossible.

Importation.—I have now to report as follows :—152 tons of manure have been imported during the year, and 500 cases of seed potatoes. These figures are lower than usual, and I think indicate that merchants are selling at reasonable rates, and I would suggest the Association should consider whether it is advisable to continue to import. I feel sure merchants would undertake to import for us at a reasonable percentage, and the Secretary would be relieved from a vast amount of work and responsibility.

To Mend a Three-legged Pot.

THE usual three-legged kafir pot is very often coming to grief by the loss of a leg, and is then usually thrown aside as unprofitable, but there is often a chance of mending them without much trouble or a great expenditure of money. All that is required is a bolt of a length suitable to the other legs of the pot, with two nuts on it, and two washers that will cover the hole in the pot completely and allow a bit on each side. A half inch, or even a five-eighths inch bolt is the best. Screw one of the nuts on to the bolt as far as it will go, and put on a washer. I make what I want out of a piece of sheet galvanised iron, cutting them out with a pair of tin cutters, and drilling a hole with an ordinary brace and a Morse drill; put the bolt through the hole in the pot,

fill in round the bolt with mealie meal until the meal is even with or over the thickness of the iron of the pot, then put on the other washer and nut, and screw up as tight as possible. I have done pots of all sizes like this, and had them go on again for years without breaking; some of my pots have two legs put in this way, and are as good as ever. The meal swells as soon as the water is put in and closes the joints, and once the pot has had a cooking of porridge made in it there is no more trouble as a rule. The washers should be hammered a bit to fit the shape of the pot before they are put on. See that the bolt is as near the centre of the hole as possible before screwing up the nuts. A 5 or 5½ inch bolt is about right.—*Agricola : Witness.*

Ticks and African Coast Fever.

By CHAS. P. LOUNSBURY, in the *Transvaal Agricultural Journal*,
Government Entomologist of Cape Colony.

HOW SOME OTHER DISEASES ARE TICK-TRANSMITTED.

Positive proof of the transmission of other diseases than Redwater and African Coast Fever by ticks has been obtained, I believe, only in the cases of Heartwater and Malignant Jaundice. Heartwater is a frequently fatal disease of sheep and goats. It occurs in the south-eastern part of Cape Colony, and, according to Dr. Theiler, is common in the bush veld in the north and east of the Transvaal. Malignant Jaundice (Piroplasmosis) is a disease of dogs, akin to Redwater in cattle, found widespread in the Transvaal and elsewhere in South Africa where ticks are known. It also occurs in the southern part of Europe.

Heartwater has nothing in common with Redwater or African Coast Fever other than that it is tick-transmitted, may attack cattle, and, being acquired on tick veld may possibly occasionally occur coincidentally with either of these diseases. The organism of Heartwater is unknown. Only one kind of tick, the bont tick (*Amblyomma herbraeum*) is known to be associated with the disease.

Other kinds have been fed on sick goats and have been afterwards tested on susceptible goats, but always with negative results. Heartwater infection appears to never pass through the egg stage of the tick. It is acquired by the Bont species in one stage of its life, and transmitted by later stages of the same individual, this tick being one which drops off its host to undergo both its moults. Moreover, it only appears possible for the tick to acquire the infection during the fever period, or within a short time, say about a fortnight, afterwards.

A tick infected as a larva may remain infected throughout its life, and transmit the infection when it becomes adult, no matter on what kind of animal the nymph or intermediate stage was passed. In other words, an infected tick may feed as a nymph on a horse or other non-susceptible animal, be carried to a distant place, and in the next stage, if it gets on to a susceptible animal, may transmit Heartwater, and that fatally.

Malignant Jaundice is also transmitted by a kind of tick that drops from its host, both as a larva and a nymph, to moult its old skin. The tick in this case is the commonest tick on dogs in South Africa (*Haemaphysalis leachi*). The infection of the disease, it has been positively determined, is transmitted by this tick only in the adult stage of life, and then only when as an adult in the previous generation it fed on the infective blood of a sick or recovered dog. In other words, the infection passes through the egg stage (as in Redwater), and also through the larval and nymphal stages; and adults which as larvae or nymphs, or both, fed on infectious blood are quite innocuous if from

parents off susceptible dogs (or even other kinds of animals) when larvae and nymphs may be pathogenic if they are progeny of parents off sick or recovered dogs. It, of course, follows that the disease may be spread to new centres without being carried there by affected dogs, or even dogs at all; for instance, the larval ticks from a parent off an infectious dog may attach to a jackal, and be dropped several miles from where they were picked up; the nymph may attach to some other animal, as a cat, and be carried still further; and thus, finally, the adults may give a dog the disease at a place where no strange dogs have been for years. It is not known yet whether or not other kinds of ticks that get on to dogs in South Africa act as carriers of the infection; but as our dog tick is not known in Europe where the disease occurs, more than the one species must be capable of acting the part of alternate host. A careful experiment has shown that the dog flea does not convey the infection.

No one has yet observed the presence of the casual organism of any of the tick-transmitted diseases in the ticks themselves other than in the recently ingested blood; but there is very good reason to believe that in every case the organism undergoes development as in malaria, and in some form becomes stored in the salivary glands, either of the same tick (Heartwater) or of the progeny (Redwater and Malignant Jaundice.)

The fact that Heartwater is transmitted by one only of the many kinds of ticks that have been experimented with is a strong indication that no blood-sucking parasite other than a tick of some kind is likely to take a part. Surely, if, say, a mosquito, also could carry the infection any kind of a tick would? Similarly, if the larva or nymph of the dog tick cannot transmit Malignant Jaundice, it is improbable that any parasite other than a tick is able to do so. And as the experience with malaria is to the same effect—only *Anopheles* mosquitoes being transmitters—we may feel fairly confident that, as African Coast Fever is transmitted by a tick, it is not normally transmitted by anything else.

IMPORTANCE OF ASCERTAINING HOW AFRICAN COAST FEVER IS TRANSMITTED.

A little reflection on the foregoing paragraphs shows the importance of ascertaining how and by what tick or ticks the disease is transmitted. It is a disease more fatal than Rinderpest, and the outlook for preventive inoculation, such as is successfully practised for Redwater, is not particularly promising. For its control, reliance, apparently, must be wholly or chiefly on the rigid quarantine of infected and suspected places, and in measures to suppress the ticks.

If ticks of the *Boophilus* type were carriers, as in Redwater, and were the only ones, the question of an infective quarantine would be simple, and would affect the movement of cattle only; but if the infection is carried by other kinds of ticks, analogously to the manner in which Heartwater or Malignant Jaundice is carried, there is a grave element of uncertainty in a quarantine affecting cattle only, and the extent of this uncertainty can only be determined by a full knowledge of what ticks are concerned, and at what stages of life these can become infected, and when they can transmit the infection. Now, as related above, the brown tick in its adult stage has been found to transmit African Coast Fever, and hence there is an element of uncertainty in a quarantine on cattle only, for the brown tick has many hosts, and drops to the ground to undergo its transformation from one stage of life to the next.

To get the best results from measures to destroy the disease-transmitting ticks, it should be known, not only what kinds these are, but what situations on the body they prefer in their different stages. The value of this knowledge will be more apparent when we come to consider the habits of the different species found on infected veld.

Another extremely important point is to determine if ticks from salted as well as sick animals convey the infection. In the case of Heartwater such ticks carry no infection, whereas in the cases of Redwater and Malignant Jaundice they may be virulently pathogenic, and are probably much more frequent transmitters of the respective diseases than ticks from actually sick animals. As African Coast Fever is apparently allied to these latter diseases, it is probable that cattle salted to it do make ticks infective.

SPECIES OF TICKS ON SICK CATTLE.

Through the courtesy of the Chief Veterinary Surgeon of Rhodesia, I have received about a score of sendings of ticks taken from sick and recovered animals. Some of the lots were collected about Salisbury, and were sent by Mr. Gray himself; others came from Veterinary Surgeon E. R. Edmonds, stationed at Bulawayo; others from Veterinary Surgeon E. M. Jarvis, stationed at Umtali; and still others from Mr. Orpen, at Melsetter. Most of the sendings consisted of what female ticks were found on the animals without respect to kind, and may, therefore, be taken as representative of the species that are most common. In the order of abundance the species were the Blue Tick (*Rhipicephalus* (*Boophilus*) *decoloratus*), the Brown Tick (*Rhipicephalus* sp., perhaps *Shipleyi*), the Bont Leg Tick (*Hyalomma aegyptium*), the Red Tick (*Rhipicephalus* *Evertsi*), and the pitted Black Tick (*Rhipicephalus* sp., perhaps *Simus*.) The Blue Tick formed the bulk of nearly all the sendings.

In the Transvaal I was able to observe for myself the species that occur on cattle in the

vicinity of Pretoria and Nelspruit; also those near Lourenco Marques in Portuguese East Africa. They are the species mentioned for Rhodesia, with the addition of the Bont Tick (*Amblyomma hebraeum*.) About Pretoria only the blue and red species were at all common at the time of my visit, but at Nelspruit and Delagoa Bay, where the disease was then endemic, all the species were generally present on any oxen examined. The blue ranked first in numerical abundance, and the brown second. The red was the least common. Probably the relative as well as the actual abundance varies considerably with the time of year, and it is likely that other species occur to a limited extent. Amongst the kinds recorded, however, must be found the carriers of African Coast Fever, and we already know that the Brown Tick, at least, is guilty.

All the ticks mentioned were already in the Transvaal before the advent of African Coast Fever; and so only the disease, and not both the disease and its carriers, have to be introduced to the tick parts of the country to get the infection established. All these ticks, with the possible exception of the Pitted Black Tick, also occur in the south-eastern parts of Cape Colony, and I have no doubt that the disease would thrive there, and spread rapidly if left to itself, should it get introduced. The southern and south-western districts of the Cape are also in some danger, for although the Brown Tick does not seem to occur in them, they have a species (*Rhipicephalus capensis*) which is an exceedingly close relation.

TESTS TO DETERMINE PATHOGENICITY OF DIFFERENT TICKS.

The experimental tests that resulted in demonstrating the association of the Brown Tick with the disease have already been given. Many other tests have been made at Capetown with ticks of other kinds from sick animals, and also with the Brown Tick in its nymphal and larval stages, but all have been proved negative in regard to this disease. Seven different lots of Blue Tick larvae, one of Red Tick larvae, three of Brown Tick larvae, and two of Pitted Black Tick larvae, all from eggs laid by ticks taken off sick cattle in Rhodesia; two lots of Brown Tick larvae from eggs laid by females off recovered cattle in Rhodesia; and two lots of Brown Tick larvae from eggs laid by females off recovered cattle in the Transvaal have been tested. With the exception of the Pitted Black Tick, which attached in scanty numbers every time, enough of the larvae attached and fed to make the tests seem fair. Bont Leg larvae have invariably failed to attach at all readily to cattle in my experience, so the indications thus far are that larval ticks of none of the kinds found in Rhodesia on sick cattle convey the disease. Many more experiments will be conducted, however, before the evidence is considered

conclusive. As the blue tick remains on its host throughout its three life stages, the evidence with regard to this species is that it is not a transmitter. Here, again, more tests will be made before all doubt is considered removed.

A number of engorged larvae of the Brown Tick were secured at Nelspruit from animals that succumbed. These ticks moulted after a few weeks and were then, as nymphs, tested on three cattle at Capetown. If the transmission took place as in Heartwater, cases of the fever would have resulted; but the results were as negative as when larvae were used. It must be mentioned, however, that one of the animals employed most unexpectedly developed typical Redwater. The fever came up fifteen days after the application of the ticks, and terminated fatally six days after. The microscopical examination of the blood and the post-mortem examination of the viscera were made by Mr. Robertson. Five days later the ticks were put on the animal was inoculated, through a mistake, with blood from the second case of African Coast Fever; but another animal was similarly inoculated, and remained unaffected. The animal inoculated from and both inoculated were from a district far removed from any Redwater area, and hence were all; presumably, non-immune to this disease. No other case of it has ever occurred in the experiment stables, and there is, withal, no valid reason to suppose that the infection came from any other source than the nymphal Brown Ticks.

These failures to transmit African Coast Fever with the larval progeny of mother Brown Ticks off diseased and recovered animals, and with Brown nymphs which as larvae fed on sick cattle, in contrast with the successes on the two occasions when Brown adults were tested, naturally arouses the suspicion that this disease is transmitted like Malignant Jaundice, that is that the infection is taken up by the adult of one generation and transmitted by the adult of the next. If no accident happens to upset experiments now in progress, the question will probably be settled in ten or twelve weeks. By that time it is expected that adults descended one generation from specimens off sick Rhodesian cattle will have been reared. The rearing on oxen of species of ticks that dropped from their hosts to moult is a tedious process, and beset with easily imagined difficulties when one thinks of the minute size of the early stages, and the natural objection of the animals to wear "catch cloths" for the recovery of the specimens. Great care must be taken not to lose any, lest accidental infections take place. One must start with a large number of larvae to rear a relatively small number of adults, for the death rate is appalling. The greatest drawback in the experiments thus far has been an insufficiency of material. The lots of ticks from Rhodesia were all small, although they in-

cluded all the swollen ticks that were found on the animals from which they came. In most cases two weeks or more passed before the specimens reached Capetown, and by that time the weakest had generally succumbed, and the remainder (in summer) had laid a large share of their eggs. Eggs laid during the journey had often to be discarded, as those from females of different species had become mixed. A satisfactory number of engorged female ticks off sick cattle were secured at Nelspruit, but so slow is the development of ticks in winter at Capetown that no eggs laid by these ticks have yet hatched.

HABITS OF TICKS.

The habits of ticks on and off their hosts, and the duration of their various life stages, have considerable bearing on measures that may be used for their destruction, and it is therefore desirable to briefly record what is known of the species common to the disease area.

The Blue Tick passes both its moults on the host, as already noted. It completes its growth in about 24 days. The eggs are laid in one mass on or in the soil or surface rubbish, and the female dies where she is at the completion of the duty. The male remains on the animal for a fortnight or more longer than the female, and finally perishes on the skin. The egg stage lasts six weeks to four months at Capetown, according to the time of year. The young ascend the grass, bushes, or whatever else is by them, there to await, perhaps for months, for an animal to pass or brush them off, for be it understood ticks subsist entirely on blood, and can fast for very long periods. The Blue Tick locates almost anywhere on the skin, maturing equally well on the thick hide of the back as on the udder. The full life cycle, when no time is lost in searching for a host, may be completed in ten weeks of summer weather, and there may be easily seven generations in two years in warm parts of the Transvaal. The ox is the principal host, but the species fully develops on the horse, mule, donkey, sheep, goat, dog, and probably a wide range of other animals. All the other species to be considered have egg-laying habits like the Blue Tick, all the females die when the egg masses are complete, and all the young climb upwards to await a host, although they may remain amongst the egg shells or in crevices of the ground for several weeks if the weather is cold. The eggs of the different kinds are of about the same size, so, as a rule, the larger the female tick the more eggs it lays. The number varies from about 4,000 in the Blue Tick to about 15,000 in the Bont. The Red Tick larvae seldom settles down to feeding except in the ear, and there it usually goes as far as it can. It transforms to the nymph without letting go its hold, but when it becomes full fed for the second time it drops off to undergo the transformation to the adult stage. The stay in

the ears lasts about sixteen days. The adult is as particular as the larvae in its choice of a feeding ground, and selects the almost hairless region about the anus and genitals. It is easily distinguished from other ticks in this stage by its saffron coloured legs. Though so fastidious about where they settle, all stages of the species readily attack cattle, horses, sheep, goats, and dogs. The adult climbs a support and awaits the passing of an animal, as does the larvae. Six or seven days is all that is generally necessary for the female to engorge with blood. The male remains on for several weeks, and so does the female if no male is by to mate with her. There is little chance for more than two generations in a year.

The Bont Tick larva is neither very particular as to host or situation, and rivals the Blue Tick for unkind attentions to mankind. It feeds about five days, if on a favourable spot, and then drops off to spend three weeks or more in transforming to the nymph. The nymph generally hunts a host from the ground, and so does the adult. Any place on almost any animal seems to satisfy the nymph. Ostriches and fowls often suffer, and also bucks (antelopes) to a slight extent. About five days are required for the nymph to satiate its appetite, but on the legs of small stock a fortnight may be required for both it and its larva. The nymph generally takes a month or longer to moult to the adult. The adult attaches almost exclusively to the under and rear part and legs, only rarely is it seen on the back or high on the flanks. The male feeds about five days, and then may be joined by the female. The female takes eight days or longer to engorge after finding a mate. The ox is unquestionably the chief host of the Bont Tick adult, but the species can, and frequently does, feed on the horse, ass, sheep, goat, and dog, and probably on other animals. The eggs take from fourteen weeks to ten months to hatch at Capetown, and a full year is as short a time as will suffice for the complete life cycle under ordinary conditions.

The Brown Tick has not been studied. Larvae were found on all parts of an ox at Nelspruit, even on the back, and the nymph does not appear to have any special preference when locating itself. The adult, however, is very partial to the inside of the ear. It does not go deep in like the larva of the Red Tick, but principally infests the hairy margin. A few specimens at Nelspruit were seen on the belly, udder, and legs. The larvae and nymphs that had been reared have taken from four to fifteen days to feed, and very few adults from nine to twelve days. As to other ticks, the engorgement is very rapid towards the last, the body of the female fully doubling its size during the final day. Adults were collected at Nelspruit from the ox, horse, donkey, sheep, goat, and dog. The Brown Tick takes its name from the colour of the males and unfed females. The legs are

as dark as the back. The male develops a tail-like appendage after feeding some days. The adults climb supports to await the passing of animals. The Red Tick is almost the same size and colour as the Brown, but the paler legs suffice to distinguish it, and the male has no tail. Several other species of ticks that occur in South Africa are even more like the Brown.

The Pitted Black Tick was seen frequently at Nelspruit on diseased cattle, and is so nearly related to the convicted Brown Tick that it will be closely studied. However, the last seem little inclined to attach to cattle; it drops off to moult. The adult appears to attach most freely to the legs. The ox may not be an important host of the species. At Nelspruit more than were taken from all the cattle together were found on a single dog, and on the back, neck, and flanks of this animal were freely infested. Specimens from dogs have also been received from Rhodesia. The species is of about the same size and general appearance as the Brown. The male is darker in colour, practically black, and has scattered pit-like depressions on its otherwise smooth back; it, too, grows a tail, but one relatively broad and short; the female, regularly arranged pale stripes after engorgement—a rather unusual character.

The Bont Leg Tick is found throughout South Africa, and is often found common in parts much too dry for the Blue and Bont species. Many efforts to rear it at Capetown have all failed, the larva evidently requiring a particular host not offered to it, or some restricted part of the body where it was not tried. Large numbers have been applied to cattle, goats, dogs, fowls, guinea-pigs, and men. A very few larvae of hundreds of thousands applied have fed upon goats. Both moults are passed off the host. The adult hunts from the ground, and prefers to attach to relatively hairless places, such as under the shoulder and thigh and about the anus and genitals. Large and small stock, ostriches, and dogs are attacked.

VELD BURNING.

From the foregoing notes on the habits of the various species of ticks that have to be contended against in the Transvaal, it is evident that veld burning, whatever injury the measure may incidentally cause, is certainly a very direct means of tick destruction. The myriads of young ticks on the grass tops have no escape, and doubtless many adults of the Red and Brown species, also awaiting hosts from Brown species, also awaiting hosts from that point of vantage get fatally scorched. But the eggs in the ground, the laying females, and those kinds of unfed nymphs and adults that hunt from the ground probably suffer very little. It was mentioned that the young which hatch in cold weather may remain in or on the ground. Once aroused by being well warmed, it may

be added, they usually climb upwards and appear to remain up in spite of succeeding cold and wet. Burning the veld in the coldest weather cannot, therefore, be expected to be as productive of good as burning at the approach of spring, when with warmer weather more and more young ticks ascend and remain at the grass tops. Too early burning probably often leads to the new grass becoming infested as soon as it starts with the young ticks, which a later burning would destroy; and, also, by exposing the ground to a greater degree of warmth from the sun, may materially hasten the development of eggs, and thus make the grass intensely tick infested at a date when relatively few ticks are on in-burned veld. Long experience has taught farmers when burning gives the best results, but these few words in explanation of the difference in effects from late and early burning may not be uninteresting.

Young ticks are most abundant in mid-summer, but burning then is out of the question, and even if it were not vast numbers of ticks would still escape, as there is no time, under the ordinary South African conditions, when there are not ticks in all stages to be found. When burning is practicable, it is a measure that can be relied on to keep the tick pest in check, but it is wholly inadequate to control the transmission of diseases through tick agencies.

SPRAYING AND DIPPING.

Many useful deductions may be drawn from the notes on the habits of the different ticks by him who would intelligently spray or dip. It is evident that not much over three weeks can be safely allowed to intervene between treatments for the Blue Tick if the dropping of mature females is to be prevented, as this species engorges in about twenty-four days. To catch every Bont Tick female, the intervals should be no more than a fortnight at the outside, which allows a day for males to get on to the animals, five for these first males to get ready to mate, and eight for the females to mate and engorge. To catch every Red Tick, the interval should be no more than a week; but by depending on the destruction of the larvae and nymphs for the control of this species fourteen days might be allowed to intervene, as the early stages pass this length of time in the ears. It is not yet known how soon after their arrival the Brown Tick females may be ready to drop off, but probably the time is about ten days; but to catch all the larvae and nymphs treatments every four or five days would be necessary. As treatment at such short intervals are impracticable, and if African Coast Fever is transmitted like Malignant Jaundice (as is suspected), it follows that cases of the disease might keep appearing for many months amongst a herd regularly and thoroughly dipped every ten days, but kept on the same veld. Eventually the in-

fection would be eliminated, because no females would be allowed to mature.

The arsenical preparation recommended by Dr. Hutcheon, and used by the Repatriation Department, is the most reliable dip for the destruction of ticks that has yet been devised. It was evolved in Queensland, and there has the reputation of destroying every tick. Its claim to perfection, however, is not undisputed, and I deem it very probable, myself, that a small proportion of the ticks on a much infested beast always escape. Moreover, a *Boophilus* tick akin to our Blue Tick is the one great tick in Queensland, and it may be that the results obtained when that tick alone is concerned are better than with kinds of different habits. Some persons have judged the efficacy or otherwise of various tick washes from sousing specimens in the substances, and afterwards setting these ticks aside to see if they lived or died. If judged by data thus collected some of the best dipping mixtures are failures, for their action depends largely on the ticks being kept wet with them for some time. The hair of the animals performs this important function, and whilst many tick specimens pulled from an animal and put in a box immediately after dipping may survive those left on may nearly all perish. But some portions of the skin are wholly or nearly devoid of hair, and ticks there situated are very apt to escape. I have seen what appeared to be a "clean sweep" made of the Blue Tick by a thorough treatment which failed to destroy one half of the Red Tick, a species which is, as explained above, located on the naked skin.

Carbolic dips, like Jeye's, McDougall's, Little's Non-poisonous, &c., are not to be trusted as tick destroyers. Neither are nicotine nor lime-sulphur dips. These dips, however efficacious they may be for scab, lice, and fleas, fail to act satisfactorily against ticks, even when they are used at strengths injurious to the skin. In the Capetown stables we are now "harvesting" a heavy crop of the Blue Tick from two oxen that were thoroughly sprayed ten days ago with Jeye's Fluid, in the proportion of one part to twenty-five of water. The application was made to cheek mange, and for this purpose it appears to have been perfectly successful. The carbolic dips do destroy a proportion of the ticks, especially of the Blue species, and so have gained the esteem of many farmers. Cooper's and other arsenical dips are good tick destroyers if used strong enough, and with soap to increase their wetting capacity. The active ingredient in them is the arsenic, while for ticks the sulphur seems superfluous. Equally or more efficacious, and vastly cheaper, are arsenical mixtures made after the Queensland formulae, the best of which is followed in the dip prepared for the Transvaal Repatriation Department.

The experience with arsenical tick destroyers is limited in South Africa, so I may

be excused for suggesting that very careful observation should be made to determine whether or not they are equally effective on all stages of the tick, and under all atmospheric conditions. In some tick destroying experiments with Cooper's Dip and arsenite of soda, made by Mr. L. J. Roberts and the writer, at the former's farm, near Fort Beaufort, C.C., four years ago, the results of different days lacked uniformity, and the variations in efficiency were then provisionally attributed to differences in the temperature and other weather conditions that affect evaporation, and perspiration by the animal.

Paraffin oil is used somewhat at the Cape for the destruction of ticks on stock. Ordinarily, it is used with water in the proportion of one part of oil to four of water. Special pumps which mechanically mix the two liquids in proper proportion are employed, and the mixture is applied in a dashing spray. The oil, both alone and mixed with water, is an excellent tick destroyer, and it acts far more quickly than arsenical washes, but the ticks on hairless parts are apt to escape, and also such of the Blue species as chance to have ceased feeding as larva and nymph preparatory to moulting. The object of most farmers who spray is to kill the Bont Tick, consequently only the under and rear parts, the legs, and tail are generally treated. The spray has to be forcefully applied to be effectual. Sponging the animals over with oil is found less effective than force spraying, and more apt to inflame the skin.

The ears of the animal should have special attention in spraying or dipping for the control of African Coast Fever, since it is there that the Brown Tick locates as an adult. But as the larvae and nymphs of this tick may infest any part of the body, the treatment should be everywhere thorough. Spraying, while highly useful for reducing the numbers of ticks, should not be trusted for the cleansing of animals moving from infected to clean

areas. It is far more difficult to spray properly than it is to dip properly, and hence there is a much greater lack of uniformity in the results obtained by different persons.

Finally, in concluding this memorandum, I desire to support the suggestion made by Dr. Hutcheon, under the heading "Preventive Measures," in his report, to the effect that infected herds should be dipped and then at once taken to high veld, where from long experience it is known that ticks do not survive over winter. To let susceptible cattle remain on infected veld is simply to court their destruction. Even if they are dipped so frequently that no female tick matures on them, the disease will keep on claiming victims until the supply of infective ticks from the ground is all exhausted. This might take several months, if the surmise that the infection is transmitted as in the case of Malignant Jaundice is correct. To keep recovered cattle on tick infested veld is probably to keep the infection permanently present.

Owing to the discovery that the thrice dropping Brown Tick transmits the disease, it appears that the simple exclusion of all cattle is not sufficient to effectually quarantine infected veld. But by keeping the veld pastured with other classes of stock, and not permitting the animals to come off, the quarantine will confine the infection. The more closely pastured it is the better, for the more quickly then will the ticks be all picked up and rendered innocuous by passing the adult stage off infected cattle. A full year is not too long a period for a quarantine.

Through transport by any kind of animal from infected to clean areas where ticks occur is evidently not without risk of spreading the disease, and if possible should be prevented; the wagons can safely go through if drawn from the border by animals not allowed to mix with those from the other side.

Correspondence.

To the Editor Agricultural Journal.

BARK FOR SOUTH AUSTRALIA

THE following is published for general information:—

93, Currie Street, Adelaide,
South Australia,

27th October, 1903.

The Hon. Minister of Agriculture,
Pietermaritzburg, Natal.

DEAR SIR,—We are desirous of importing some Natal Mimosa (or wattle)

bark for tanning purposes. We should, therefore, be glad if you would kindly place us in communication with two or three reliable firms who are handling bark. In order to save time, we would be glad if you would get those firms to send us small samples and quotations c.i.f., Adelaide, Melbourne and (or) Sydney.

Thanking you, etc.,

GEO. WILCOX & Co.

Noodsberg Road Agricultural Association.

ANNUAL MEETING.

THE following is taken from the Annual Address of the President of the Noodsberg Agricultural Association (Mr. H. von Buelow); the meeting was held on the 17th inst. :—

I have the honour to put before you for your approval the Sixth Annual Report of the Noodsberg Road Agricultural Association.

You are all aware that the season just ended has been a particularly trying one for farmers on account of the drought, the severest the Colony has experienced for very many years. In spite of this, one might almost say calamity, this year's Show, the holding of which is one of the chief objects of the Society, has been an unqualified success. This is almost entirely due to the efforts made by the members of the Society to do their utmost to obtain this end.

As this is not a stock-breeding district, the entries for these classes at the Show were not so good as are to be seen at other Shows, although there were a few very good entries for cattle, and the fowls were excellent. The produce sections were second to none, not even at the Maritzburg Show were there better exhibits in these classes. There was a very good collection of mealies and potatoes; the dairy produce being particularly well represented, which shows that the farmers' wives take also a great interest in these Shows. Black Wattle Bark was very poorly represented considering that this is the best wattle district in the Colony, and that there were very good prizes offered, but the drought prevented very many who would have liked to exhibit from competing; there was only one load of bark shown, and that load was not a very good load either.

The Cup for the most successful exhibitor in the produce sections was again—for the third time in succession—won by Mr. P. Rodehorst with 50 points, Mr. J. A. Westbrook coming next with 46 points, and then Mr. F. Reiche with 41 points.

There is no doubt that these Shows,

besides much other good they do, prove what a district is able to produce, and thus enable the authorities to gauge the requirements as regards railway facilities, roads, etc., and we should always work with these facts in our minds, and let us hope that the present Ministry will be represented at our next Show.

The mealie crop has been, as was expected, a thoroughly poor one. The same may be said of potatoes and all other crops. Mealie crops were almost destroyed by "aphis," a new plague, which was brought on by drought. Importations of mealies from America have kept prices down, especially as these were allowed to come in after the import duty was reduced 50 per cent. This has had the effect of lowering the price to such an extent as not to make up for shortage in crops, although ruling higher than most years. The General Manager of Railways had also put such an exorbitant rate on the Colonial mealies that it was cheaper to send 100 lbs. of tea to the Transvaal than 100 lbs. of mealies. This was rectified when the attention of the Minister of Lands and Works was drawn to this absurdity. The same absurdity, not to say unfairness, exists with reference to certain products which interest us largely. I refer to the railway rate of firewood and bagged bark in truck loads in comparison to the rate charged for coal. The latter is carried at the rate of $\frac{1}{2}$ d. per 2,240 lbs. per mile, and Government allows a certain rebate for all coal exported. Sugar cane is carried at almost the same rate when in truck loads, whilst we have to pay 1d. per 2,240 lbs. per mile for firewood, and as much as $1\frac{1}{2}$ d. per 2,000 lbs. per mile for bark. To put this in plain figures the difference of carriage is so considerable that you would realise 10s. per ton more for your bark if it was carried at the same rate as coal. The same refers to firewood; it did not matter so much when we got very high prices for our firewood as we did during the war, but as the price for firewood is very low now, I consider we up-

country farmers are also entitled to some consideration. The wattle industry has also been hampered very much on account of the drought, and according to reports from Germany, Australia is trying hard to regain the European market, and it is very likely that this will affect local prices, so we are entitled to consideration from Government. The Conference Steamship Lines had decided to raise the rates 50 per cent. from the first of March, 1904, but they will probably not bring this into effect.

Disc ploughs are coming in for a good deal of attention and discussion this season. Those shown by one firm at a trial held on Mr. Oellermann's farm near Dalton did not make a good impression on onlookers, who mostly preferred to retain the ploughs hitherto used. For this the particular make of ploughs shown is to blame. I hear the other manufacturer's disc ploughs are doing good work, among them one used by Messrs. Holley Bros., and imported by them from America.

African Coast Fever, is coming nearer, it being not very far from the Natal border in the New Territory. Government, as well as the farming community, are fully alive to its dangers, and actively engaged in preparing to combat the disease. There seems to be no doubt whatever now that it is carried by ticks. No curative method of dealing with it has as yet been spoken of in Professor Koch's reports. Preventative measures which will be somewhat easy by the slow progress of this scourge should do some good at least. Government intend to make dipping compulsory, and with that point in view have decided to grant loans at a low rate of

interest for the purpose of erecting dipping tanks; the amount not to exceed £100, repayable in four years. An excellent model of a tank erected by Mr. George Alexander is on view at the Agricultural Department in Pietermaritzburg. The Government assistance makes it possible that all cattle owned by farmers can be dipped, and as this seems to be the only and a good preventative, no trouble should be spared to bring this about, and the Government is to be thanked for taking this step. To cure cattle once taken ill is next to impossible.

We have further to thank the Government for starting what is called "Farmers' Experimental Plots." According to a notice in the *Agricultural Journal*, farmers are invited to ask the Agricultural Department to establish such plots on their farms. I hope the farmers will avail themselves largely of this opportunity, as this is the cheapest way to find out what manures are required on their farms for growing certain crops. Another new institution is the "Cash on Delivery" System on the railway. This has largely been in use in Germany for several years, and it works very well there. I am sure it will be appreciated here also as soon as the working of it becomes universally known.

In concluding, I have again to thank the once-bearers in the name of the Association for the trouble and energy they have shown during the year, and especially in connection with the Show. As usual, I have to thank especially our Hon. Secretary and Treasurer; and you all know that a great deal of the success of the Show is due to him and to his never tiring efforts to make the Show a success.

Price of a Cattle Dip.

By ERGATES.

MR. THOS. STEAD, Thornville Junction, has just finished the building of a dip, and on the 17th inst. he used it for the first time. Several neighbours were present, including Messrs. D. G. McDonald, Thos. Horwood, W. Palfreman, W. S. Crouch, and Mr. Appleton. The process of dipping was successfully

accomplished, and about the efficacy of the tank in every respect all were satisfied. Mr. Stead was, of course, carefully observing the operation, and he came to the conclusion to try two or three of the suggestions which were reprinted in the last issue of the *Journal*. The suggestion of Mr. Walker to narrow with

planks the footway to the tank for the purpose of preventing animals turning round or getting two abreast he will adopt, also the windlass, and breeching, and the sump in the entrance way to the dipping pens, all recommended by Mr. G. S. Armstrong, M.L.A.

Mr. Stead, at the exit from the tank, has a comfortable series of steps, and one of the visitors told me that in the tank which he and some others in combination are having built, they are putting in still broader steps. This departure from the Nel's Rust plan did not favourably impress me. On several occasions a beast on arriving at this comfortable footing stood still instead of quickly scrambling out as it should, and as, on one occasion, I observed at a dipping at Nel's Rust, they invariably did. Delays are thus caused, and what is worse, another beast, if quickly following, takes up a position side by side with the stationary one. When one of them begins the ascent the other, instead of waiting to follow, strives to go up shoulder to shoulder. If these comfortable steps are a defect it is happily one that can be remedied at but little trouble or cost.

After the cattle had been dipped about a dozen horses were sent through the bath. They gave practically no trouble, and immediately after being released commenced grazing.

Mr. Stead very kindly gave me the cost in detail of his dip.

	£	s.	d.
Mason's work, 18 days at 15s. per day	13	10	0
15 Natives, 18 days at 2s. per day	22	10	0
26 Casks cement	20	16	0
2 Tanks, pipes, and taps	10	0	0
Bricks for boiler	3	0	0
8 Iron rails for roof and doors	2	2	0
Corrugated iron and timber	10	0	0
Tar	0	12	0
Sliding doors and pulleys	2	0	0
Posts and rails	4	10	0
Railway carriage and transport of material	3	0	0
Carting of stone and sand	3	0	0
	£95	0	0

The tank was completed in three weeks. The £10 for corrugated iron and timber is practically all for the roof, which some who are building tanks do not consider indispensable. The big item for labour is chiefly accounted for by stone-breaking for the concrete. The stone was very hard. The cement account may be considered a full one. Mr. Armstrong's cement bill was for only 20 casks. Bricks instead of concrete would, under the conditions of many, be cheaper, but even if well laid in cement it is possible that they would not prove so resistant to leakage as concrete. Everything that should be debited to the Dip is included, Mr. Stead assured me. The account should be of service to many at the present moment; it will show that competently managed a first class Dip can be constructed for a sum less than £100.

Management of Manures.

THE farmer is often at a loss to know what fertilisers to mix with safety without deleterious chemical combination taking place. The following should not be mixed :—

Farm yard manure or dung with lime, or basic slag.

Nitrate with Thomas's Phosphate.

Nitrate with superphosphate.

Sulphate of ammonia with Thomas's Phosphate.

Superphosphate with slag.

Those that can be mixed with safety are as follows :—

Sulphate of ammonia with superphosphate.

Nitrate with bones.

Sulphate with bones.

Bones with slag.

Nitrate with phosphatic guano.

Sulphate with phosphatic guano.

At times some of the chemicals have a tendency to "set," i.e., Nitrate of soda and kainit, and thus have to be powdered again to enable them to be sown. Rub and, as soon as mixed, apply to the land. Keep as dry as possible until then.—
Farmer and Stock-breeder.

Imported Devons.

THE following Devon cattle were shipped by Mr. Fergus A. Hathorn, per "Inkonka," on the 17th October last for his farm Bangwana, Polela :—

Bull—"Captain Sample," 18 months, out of "Sally" (15,571), by "Lord Calverhay" (3,469). Dark red.

Bull—"Gentleman Jack," 20 months, out of "Dorothy," by "Union Jack" (4,684). Dark red.

Heifer—"Duchess 8th," 3 years, out of ————by "Lord Breech" (3,467), by "Rector 2nd" (4,481). Dark red. In calf to "Dollman" (4,561).

Hybridising the Mango.

ON July 11th, *Indian Planting and Gardening* had an interesting article suggesting the improvement of mangos by hybridizing :—

To any one who has seen the mango grown in other countries, it must be matter for much speculation, why a fruit so highly prized by all and sundry, has not been crossed and hybridized to improve it. Perhaps it may be argued that the varieties of mango already in cultivation are sufficient for all practical purposes. This may be so, but were the hybridist to take the matter in hand, some extraordinary results would follow. It is, however, a fact which does not admit of doubt, that hybridizing for the improvement of existing varieties of fruits, flowers and vegetables, has made very little progress in India. Indeed, with the exception of a few flowering plants, such as Cannas, Amaryllis and perhaps a few more, hybridizing is not practised in India. The Rev. T. Firminger, in the introduction to his book on "Indian Gardening," writes :—"No efforts have been made to improve the races of plants indigenous to the country; no attempt, by any of the more refined processes of science, to produce superior varieties. It has been stated that the fine varieties of mango, for which one locality in Bombay is famous, have resulted from the skill bestowed upon their culture by Europeans, who first settled in that part of India—an assertion that rests upon very slender foundations. This is the only instance, I believe, where it is even pretended that an improved variety of fruit has been produced in India by the

art of the cultivator." The foregoing remarks stand good to-day.

Will any one question that a cross between the well-known varieties of "Langra" and the ordinary "Bombay" mango would not be an improvement upon the parents, having the characteristics of both? Yet, has anyone tried the experiment? Again, a cross between the large "Malda" (so gorgeous and tempting to look upon, but poor in flavour) and the "Langra" or "Bombay" would probably result in a fruit, having the size and beauty of the "Malda," with the flavour of the two latter. The fact remains that no attempt has yet been made to produce new varieties of mango by cross-breeding and selection. I cannot understand why this kind of work cannot be undertaken at such centres as Calcutta, Bombay, Saharanpore, Allahabad, Agra and Lucknow, in the Government gardens. All the facilities are at hand, good men are in charge of the gardens, and time and money are of no consequence. However, I hope that the foregoing observations will catch the eye of the proper authorities, and that steps will be taken to make an organized effort to improve at least one of India's principal fruits.

Curator Wanted.

A CURATOR—Gardener of experience—wanted for Pietermaritzburg Botanic Gardens; Salary commencing £12 10s a month, free house, etc. Communications from applicants should be addressed to Mr. D. ROBB, Secretary, Pietermaritzburg Botanic Society, B x No. 230, P.O., Pietermaritzburg.

Oil from Mealies.

THE Barbadoes Chamber of Commerce *Journal* for September, has the following reference to the development of a corn oil manufacturing industry:—

As an article of commerce, corn oil has become of so great value that many corn millers are investigating the process of manufacture, and establishing plants for its manufacture and production with their milling business. The oil is pressed from the germ of the corn when meal, grist, etc., are made. This portion of the seed was practically lost until the present processes of extracting oil were discovered. In its preparation the germ is ground and pressed in much the same way that flax and cotton seed is treated in the manufacture of linseed and cotton seed oil. It is said that the annual output of corn

oil in the United States is about 160,000 barrels, the principal consumers being white lead and putty manufacturers, paint manufacturers and soap makers. Corn oil is also extensively used by the manufacturers of prepared paints, although few of them will admit it. Its use in the foreign markets is said to be principally among the manufacturers of a superior quality of soft soap. It commands a higher price than any other oil used for this purpose. The oil is also employed as an adulterant for table oil. It is easily purified, forming a light, amber-coloured, perfectly transparent liquid, without rancidity, and having a pleasant taste. It is also used for lubricating purposes, and may even be used as a lamp oil.

Produce Contracts.

GOVERNMENT invites tenders for supplies for the coming year of various produce. Tenders will be received until the 30th inst., at the Audit Office. The Notices, dated 23rd October, 1903, published in the *Government Gazette*, should be consulted in the first instance. The following is a brief summary:—

Notice 739, Coal and Firewood for Government Departments of Maritzburg and Durban.

Notice 744 Provisions, including Mealies, Mealie Meal, etc., for Natal Government Asylum.

Notice 747. Provisions, including Mealies, Mealie Meal, etc., for the Government Hospital, Addington.

Notice 748, Fresh Milk for Government Hospital, Addington.

Notice 756, Provisions, Necessaries, Mealies, Mealie Meal, etc.:—

1. For the use of the Goals at Ladysmith, Estcourt, Verulam, Stanger, Umzinto, Greytown, Harding, Newcastle, Howick, Richmond, Ixopo, Umsinga, Bulwer, Port Shepstone, Dundee, Bergville, Weenen, New Hanover Mapumulo, Impendhle, Indwedwe, Krantzkop, Underberg, Camperdown, Vryheid, Utrecht, and Paulpietersburg.
2. For the supply of Mealies, Mealie Meal, and Falt to the various Departments of the Government at Pietermaritzburg and Durban, but exclusive of the Police, the Railway, Harbour, and Public Works Departments.
3. For the supply of Bread to the Postal and Telegraph Departments of Pietermaritzburg and Durban.
4. For the Supply of Beef to the various Government Departments at Pieter-

maritzburg and Durban (exclusive of the Police, Central Goals, the Natal Government Asylum, Harbour, and Railway Departments, the Public Works Department, and to Native Chiefs and Messengers.

Notice 757, Provisions, Mealies, Mealie Meal, etc.:—

For the use of the Central Goal at Eshowe, and Goals at Nkandbla, Emtongweni, Nqutu, Ndwandwe, Ubombo, Lower Umfolosi, Hlabisa Ingwavuma, Umlalazi, Mahlabatini.

Wool.

M^R. EGNER reports:—The wool season, which opened about a fortnight ago, was fully attended, and farmers have every reason to be satisfied with the buoyancy of the first two Sales. Some of the best clips realised from 9½d. to 9½d., whilst the ordinary unskirted clips, somewhat earthy, brought from 8½d. to 9d. Those who sold on the first two Sales are to be congratulated, as it will be seen by the latest cable that at the opening of the sixth series of London Sales, notwithstanding the small quantity offered, the market proved disappointing to shippers who were tempted to operate on anticipation of a rise. The next Sales will, without a doubt, show a lower tendency. I am sorry to say that up to the present the supplies have not come to the quantity of last season. This, no doubt, can be accounted for by flockmasters having sold out to the adjoining colonies. The bulk of the wool harvested up to the present has been rather, due no doubt to the drought.

Return of Fruits, Plants, and Vegetables, &c.*Examined under Proc: 87, 1900. For the month of September, 1903.*

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Sept. 1	Banana Plants	4 cases	Chinde	Matabele	Free of Pest.
" 1	Potatoes	550 "	Great Britain	Umtali	"
" 2	"	60 "	"	"	"
" 2	"	100 bags	"	"	"
" 2	Onions	20 "	"	"	"
" 3	Potatoes	250 cases	"	"	"
" 4	"	1,000 "	France	Reichstag	"
" 5	"	1,000 "	"	"	"
" 5	Fruit Trees	1 pkg.	Australia	Damascus	Fumigated.
" 5	Plants	1 case	"	Aberdeen	"
" 6	Potatoes	1,400 cases	France	Goorkha	Free of Pest.
" 7	"	1,000 "	"	"	"
" 8	"	650 "	"	"	"
" 9	"	100 "	"	"	"
" 10	Onions	151 "	Egypt	Reichstag	"
" 11	Banana Plants	17 pkgs	Mauritius	Islanda	"
" 11	Apples	40 cases	Australia	Wakool	"
" 11	Fruit	875 "	"	"	"
" 11	Potatoes	39 "	"	Ripplingham	"
" 11	Onions	75 "	"	Grange	"
" 12	Potatoes	2,400 "	France	Kinfauns Castle	"
" 12	Grapes	24 kegs	Cape Colony	Arundel Castle	"
" 14	Potatoes	1,500 cases	Great Britain	Kinfauns Castle	"
" 14	"	125 bags	Australia	Umgeni	"
" 14	Fruit	398 cases	"	Nineveh	"
" 14	Potatoes	560 bags	"	Wakool	"
" 14	Fruit Trees	1 pkg.	"	Ripplingham	Fumigated.
" 15	Plants	3 pkgs.	"	Grange	"
" 15	"	2 "	"	Nineveh	"
" 15	Onions	100 cases	Portugal	Wakool	"
" 15	Potatoes	850 "	France	Burgermeister	Free of Pest.
" 15	"	66 bags	Australia	Greyfriars	"
" 15	"	950 cases	Great Britain	Nineveh	"
" 16	Lemons	40 "	Spain	Umgeni	"
" 16	Onions	20 "	Portugal	Briton	"
" 16	Tomatoes	20 "	"	"	"
" 16	Grapes	20 "	"	"	"
" 16	Onions	67 bags	Australia	Nineveh	"
" 16	Fruit	665 cases	"	"	"
" 16	Potatoes	100 "	"	"	"
" 16	"	500 "	France	Hardwick Hall	"
" 16	"	25 "	Great Britain	"	"
" 16	Apples	246 "	Australia	Wakool	"
" 16	Lemons	125 "	"	"	"
" 17	Potatoes	12 cases	Great Britain	Briton	"
" 17	Plants	1 pkg.	"	"	"
" 17	"	1 "	Mauritius	India	Fumigated.
" 17	Onions	50 cases	Portugal	Burgermeister	Free of Pest.
" 17	"	50 "	Madeira	"	"
" 17	"	500 "	Portugal	Prinz Regent	"
" 17	Potatoes	500 "	France	Hardwick Hall	"
" 18	Onions	100 "	Egypt	Burgermeister	"
" 18	Apples	75 "	Portugal	Briton	Destroyed on account of Codlin Moth.
" 19	Onions	200 "	"	Prinz Regent	Free of Pest.
" 19	Potatoes	500 "	France	Saltwell	"
" 21	"	500 "	"	Dunolly Castle	"

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM	SHIP.	REMARKS.
1903.					
Sept. 22	Potatoes	200 cases	France	Dunolly Castle	Free of Pest.
" 23	Onions	20 "	Portugal	Carisbrook O'le	"
" 24	Potatoes	600 "	France	Dunolly Castle	"
" 25	"	450 "	"	"	"
" 25	Onions	280 bags	Australia	Nineveh	"
" 25	Lemons	20 cases	Spain	Carisbrook O'le	Fumigated.
" 25	Plants	1 pkg.	Cape Colony	"	Free of Pest.
" 26	Apples	100 cases	Portugal	"	Destroyed on account of Codlin Moth.
" 26	"	63 "	Madeira	"	"
" 26	Potatoes	300 "	Las Palmas	Africander	Free of Pest."
" 26	Onions	147 "	Australia	Gracchus	"
" 26	Potatoes	500 "	France	Africa	"
" 28	"	300 "	Las Palmas	Africander	"
" 28	"	300 "	Australia	Gracchus	"
" 28	Onions	427 bags	"	Ripplingham	"
" 30	Potatoes	64 cases	"	Grange	"
" 30	Plants	1 crate	Great Britain	Gracchus	Fumigated.
" 30	Apples	100 cases	Portugal	Kildonan Castle	Destroyed on account of Codlin Moth.
" 30	Potatoes	300 "	France	Lismore Castle	Free of Pest.

Custom House, Point, 2nd October, 1903.

A. ROBB, Acting Surveyor.

For the Month of October, 1903.

Oct. 1	Lemons	20 cases	Spain	Kildonan Castle	Scab present, fumigated.
" 1	Potatoes, Table	150 "	London	Inyati	Free of Pest.
" 1	" Seed	506 "	"	"	"
" 2	" "	600 "	"	Hessione	"
" 2	" "	500 "	"	Umvoti	"
" 2	" Table	3,100 "	France	Colonial	"
" 2	" "	100 "	Southampton	Lismore Castle	"
" 6	Fruit Trees	1 bale	Australia	Essex	Fumigated.
" 6	Potatoes, Table	55 bags	Sydney	Moravian	Free of Pest.
" 6	Apples	684 cases	"	"	"
" 7	Pineapples	16 "	Mauritius	Itola	"
" 9	Potatoes, Table	524 "	London	Illovo	"
" 9	" Seed	2,800 "	Hamburg	Bundesrath	"
" 9	" "	31 baskets	"	"	"
" 10	Lemons	300 cases	Albany	Narrung	"
" 12	Potatoes, Table	3,039 "	Hamburg	Kron Prinz	"
" 13	Ornamental Plants (Botanic Gardens)	3 "	Southampton	Donne Castle	"
" 15	Potatoes, Table	360 bags	Buenos Ayres	Winkfield	"
" 16	" Seed	679 cases	London	Inisiva	"
" 16	" Table	1,755 "	"	"	"
" 16	" Seed	2,580 "	Southampton	Alnwick Castle	"
" 16	Lemons	50 "	Italy	Feld Marshall	Scab present, fumigated.
" 16	Potatoes	300 "	London	Alnwick Castle	Free of Pest.
" 20	Orchids	2 "	"	Dunottar Castle	"
" 20	Lemon Trees	2 No.	Cape Town	"	"
" 20	Potatoes, Table	1,500 cases	France	Gymeric	"
" 30	Lawn Grass Roots	9 "	Melbourne	Australasian	"

Custom House, Point, 4th November, 1903.

C. B. JONES, Examining Officer.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab " " "	P. H. Boshoff ... A. C. Harding ... J. Snyman ... N. Grant ...	Riet Vlei Meadow Bank Vitzicht Brakfontein
J. Button ..	Estcourt, South of Bushman's River	" "	P. Ballantyne ... J. C. Boshoff ...	Bigger Waterhoek
J. J. Hodson ...	Lion's River ...	" " "	P. D. Kimber H. W. Shaw G. & B. Hutchinson	Maritzdaal Talavera Boschfontein
A. Brown	Polela	" " " " " " " " " "	C. A. Phipson ... J. Comrie ... H. Pennefather ... T. Palframan ... A. C. Thurston ... J. D. Watson ... D. 'I. Arbuckle ... J. Hayes ... Leslie Bros. ... S. Maritz ...	Strathcampbell Hepburn Home Rule Watermead The Rocks Rainbow Kenridge Glen Gariffe Dunera Maritzdale
R. Vause	Ixopo	" " " " " "	W. H. Walton ... K. Houston ... G. Houston ... G. Cooper .. G. Kippen ... F. W. Robinson ... J. Schofield ...	Greenvale The Donga Cloverton Avebury Kippen's Retreat Car End Dearland
L. Trenor	Alfred	" "	Gelatu Duly Um- banjana ... R. Mack ...	Location Whetherby
W. Gray	Upper Tugela, South of Tugela River, and Estcourt, North of Bushman's River ...	"	W. P. Gray ...	The Heff
A. H. Ball ...	Weenen	" " " "	T. Hair ... S. C. Van Rooyen C. Van Rooyen ... Mrs. P. Lotter ...	Gretna Green Middleburg Scottsberg Schottspoort
E. Varty	Umvoti, Western Portion	"	W. F. Marshall ...	Mountain Side
G. N. Perfect ...	Umvoti, Eastern Portion	" "	Baletshe ... T. Hill ...	Matimatolo Came
R. J. Raw	Impendhle ...	" " "	S. Faber ... H. Hill ... Maqundo ...	Virginia Coquidale Natal Colonization Farm

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
C. Swales	Umlazi	Lungsickness	P. W. Department	Richmond Farm, near Pinetown
		"	Native, Sam Fawkes	Assegai Kraal, near Botha's Hill
		"	John, & Mr. Kirk	Umlazi Location
E. G. Clerk	Newcastle	Lungsickness	Dundu	Styl Krantz
		"	S. W. Reynolds ...	Newcastle Town Lands
		"	Madones, Nanga- shon & Ingovaan	Tweefontein
		"	Somsen & Bearge	Dumferline
		"	L. H. S. Jones ...	Newcastle T. Lands
		Scab	W. A. Lang ...	Millstone Spruit
		"	J. T. Watson ...	Bismarck
A. J. Marshall	Dundee	"	P. M' Lief	Greenock
		"	N. B. Surtees ...	Gairnsford
		"	Hlubi Gunena ...	"
		"	Esaw Kumalo ...	Clifton
		"	A. G. Spiers ...	Jackalsfontein
C. E. Walker	Umsinga	"	Mahlaowla Utshesi	Mangabayeni
		"	Matoli Ra Majola	Nkomunye
		"	Mtshela Kumalo...	Vermaak's Kraal
		"	Ganyana Sitole ...	Mumbe
		"	A. Muller	Sutherland
		"	Uqomta	Vaalkop
J. Chaplin	Klip River	"	P. Nicholson ...	Hobeland
		"	J. Bardner	Brakwaal
		"	Umveli	Stockville
		"	Umkuzanywayo ...	Blauwbank
		"	D. R. Bester ...	Quagga's Drift
		"	J. Bester	"
J. M. Wales	Upper Tugela, N. of Tugela River	Scab	G. H. H. Coventry	Fair View
		"	W. O. Coventry ...	Acton Homes
R. Wingfield-Strat- ford	Utrecht	"	J. Voss, sen. ...	Charlestown
		"	P. Uys	Blood River
		"	M. Gregory	Frischegwald
		"	H. Potgieter ...	Rooipoort
		"	— Engelbracht ...	Spitzkop
		"	J. Allen	Grootvlei
		"	W. Haines	Klipspruit
		"	E. Van Rooyen ...	Waaiboek
		Lungsickness	H. Beukes	Roodekop
		"	P. H. Nel	Blauwstroom
G. Daniell	Vryheid	Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata	"
		"	L. Botha	Waterval
		"	Ndotyane	Rustplaats
		"	Hawse	Kromellenbourg
		"	J. R. Steenkamp...	Rustplaats
		"	G. H. Steenkamp	Bloemhoff
		"	W. Pretorius ...	Denny Dalton
		"	Z de Jager	"
		"	W. Havermann & Kun	Langfontein
		"	W. Magee	Denny Dalton
		"	J. Doyer & Fuhlo	Hartakamp
		"	Mahene	Stanley

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
G. Daniell ..	Vryheid ...	Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Inkunya ...	Twefontein
		"	Nqume ...	Vredehof
		"	Jonas ...	Bloemendal
		"	J. Coetzee ...	Grootgewacht
C. T. Vaughan ...	Paulpietersburg ...	"	Meatu ...	Haasfontein
		"	W. Craig ...	Frischegewaagd

The Province of Zululand is an infected area under the Lungsickness Act. Individual case under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni	Districts	...	...	—	for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	...	1	"	—	"
" North of White Umfolosi and Umfolosi Rivers	...	...	1	"	—	"
Total	...	2	0			

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mhlabatini, Nkandhla, Entonjaneni, Nqutu, and Lower Umfolosi Districts.

Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 25th November, 1903.

Government Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of Oct., 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same period from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	78.5	61.8	93.4	54.0	1.16	12	.45	4th	4.79	8.94
Stanger... ..	82.0	58.5	111	51	1.67	21	.73	28th	5.11	10.64
Verulam	82.9	61.9	105	53	1.24	8	.47	28th	3.34	8.66
Ndwedwe	79.3	55.8	101	47	1.43	7	.43	4th	4.46	...
Newcastle	87.6	56.8	94	48	2.01	7	1.60	15th	2.83	2.30
Estcourt	84.0	51.1	97	42	1.74	7	.85	29th	3.29	5.51
Port Shepstone	78.1	56.6	83	50	1.28	2	1.09	29th	9.27	14.13
Umzinto	88.1	55.7	94	52	2.14	4	1.18	28th	5.40	12.34
Richmond	79.3	51.2	100	39	2.16	13	.99	28th	4.68	6.92
Maritzburg	81.2	54.5	101	41	1.28	10	.49	28th	3.22	5.35
Howick... ..	81.7	49.2	96	38	1.51	9	.94	29th	3.38	4.41
Ladysmith	86.8	53.6	101	45	1.35	6	.66	16th	2.51	4.22
Dundee	82.7	57.1	93	48	3.18	4	1.57	15th	6.40	3.36
Weenen	88.9	51.5	101	38	.70	5	.25	25th	2.38	4.30
Hilton Road	78.0	47.9	98	33	1.35	10	.99	28th	2.70	...
New Hanover	85.0	53.6	100	37	1.38	13	.65	28th	3.01	...
Paulpietersburg	88.5	48.8	95	42	.87	7	.29	26th	1.79	...
Nongoma	77.3	52.6	92	55	2.66	9	1.66	29th	...	...
N Kandhla	72.9	43.3	89	57	2.98	9	1.46	29th	5.26	4.73
Qudeni	71.9	48.3	84	36	2.27	13	.50	16th	5.11	...
Hlabisa... ..	80.5	55.3	95	45	2.18	8	.70	29th	3.36	...
Melmo'h	79.7	55.3	98	47	2.31	13	1.10	29th	4.36	...
Eshowe... ..	77.0	58.1	94	50	3.17	12	.85	29th	6.90	...
Point ... ..	...	...	...	...	1.34	9	.62	3rd	5.38	...
Nqutu	77.4	34.4	91	23	2.29	10	1.14	15th	4.79	3.77
Mhlabatini	82.6	52.1	95	44	3.23	9	1.22	28th	3.94	...
South C. Junction ... ..	...	...	...	...	1.35	11	.32	4th	5.17	8.20

District Reports.

BULWER, 21st November.—The last fortnight splendid rains have fallen, the weather altogether being most seasonable. Mr. Alexander Brown, of Sunnyside, has been appointed Stock Inspector for the Division, in the place of Mr. Wm. Wilson, resigned. I hear there is only one flock of sheep in the Division infected with Scab, and I hope this will soon be clean. I have heard of no other cases of disease among stock in the Division. I regret to report that cattle-stealing is very much on the increase. The Police have lately succeeded in bringing home several cases of sheep and horse-stealing, the latter from East Griqualand. I would like to mention here the necessity for passes issued by the public for stock, giving the full description thereon of all such stock, to enable the Police to distinguish between stock stolen and belonging to private persons. Large quantities of wool are now passing through Bulwer daily from up-country. I have not been able to ascertain the general average of this year's clip, but will give it in my next report. The cut worm is most destructive this season to the mealie crops, whole fields in some instances being completely destroyed. The King's Birthday holiday was celebrated by a shooting match between Bulwer and Deepdale Rifle Associations, Bulwer coming off victorious by 61 points. At the last sale of Crown Lands no less than 23 erven of Bulwer were sold, and I hear of a great many new houses being built in the near future. A meeting is called for the 26th inst., for the purpose of discussing the vexed subject of railway connection with Bulwer. The members have been notified, and I understand the Minister of Lands and Works will be present.

H. W. BOAST, Magistrate.

HOWICK, 16th November.—At last there is something to write about. The long-continued drought seems to have completely broken, and matters appear to have, once more, acquired their normal position. On the 28th ultimo, we had the first really good rain, and we have had several showers and heavy mists since then. These rains have had the desired effect, as they have been the means of changing the dreary garb of nature into a more cheerful appearance. Farmers and Natives alike are devoting their whole attention to ploughing and planting, and in several parts the crops have already made a good start. It has only been during the last week or so that fresh potatoes have been obtainable. Other vegetables are still very scarce. The total rainfall this month up to date of writing is 2.40 inches as compared with .17 for the whole of the last month. Sheep-shearing is now in full swing throughout the district. From what I can gather, the fruit crop this year will fall considerably short of previous years. This is, no doubt, due to the drought experienced throughout the Colony. Stock is doing well and it is to be hoped that with the stringent measures which the Government are adopting with regard to the much dreaded African Coast Fever, and the removal of cattle into the Colony from the adjoining Colonies, this Colony may be spared from this scourge.

J. W. CROSS, Magistrate.

MOOI RIVER, 18th November.—In conjunction with other parts of the Colony, this District has passed through one of the most trying seasons on record. Two and a half month's continuous drought, following on the drought of last year, put a complete check to all agricultural pursuits, until the 9th inst., when ploughing commenced in full earnest, an inch of rain having fallen on the day previous. In the highlands the season is already far advanced for planting any but the earliest variety of mealies with a prospect of a good return. But on the lowlands mealies may be planted up to the 15th December; in fact mealie planting seldom commences before the 15th November, after which date the stalks are less liable to be attacked by the grub. The forage crop is now reaped and stacked and growers do not seem inclined to sell at present prevailing prices—so that the bulk will not find its way to the market before the Autumn. The crop was a poor one, probably not more than half of last year's crop—due to the scarcity of rain throughout the growing stage. Algerian is the principal variety grown; this makes a very fine stand of forage with plenty of head. It is not, however, rust resisting, as many are led to suppose, and ripens at an awkward time—just when mealie sowing is in progress; in this respect, Cape has a great advantage, as the land may be cleared in time to allow of a crop of mealies being planted on the same field—besides obviating a rush of work all coming on at the same time. So far, potatoes have only been planted in a very limited extent, but now the rain has set in more will doubtless be planted for the winter crop. The Up-to Date finds most favour, being an excellent table potatoe, and a very fair cropper. Judging by present appearances, many of the orchards that have come under my notice promise a very heavy yield of fruit, though some have suffered by the late frosts nipping the blossom. Sheep and goats are in splendid condition, and a very good lambing is reported from all sides. The "clip" this season will be considerably below the average for previous years as a large number of sheep have left the district for the New Colonies. Cattle are doing better than one could expect with the scarcity of grass; but the cows are very backward in calving, and those that have calved have little more than sufficient milk for their calves. Mange in horses has almost entirely disappeared, the only cases ever seen now are amongst those belonging to Natives. The Native is still adverse to spending a few shillings in saving his horse from destruction, and it is surprising that owners of farms permit their Native squatters to keep their horses in such a condition. The Local Farmers' Association have at last made a start at erecting the Sale Kraals, and it is to be hoped they may be ready for use in time for the next Stock Fair, as great inconvenience was caused at the last sale by the sheep of different owners getting mixed. Prices realised:—fat oxen up to £17 per head, and wethers 25s. It is expected that better prices will prevail at the next sale, as stock should come forward in better condition—the result of an improvement in the veld. To Mr. Herbert Smith falls the honour



SCHMIDT'S EARLY CHERRY (natural size).

Grown at Centocow, Dronk Vlei.

of being the first in the district to build a cattle dipping tank—he having just completed one on his farm "Mabelston." This good example should be followed by others, especially farmers in the thorn veld, where ticks are so prevalent. There is little if any local grain, and farmers are obliged to buy the imported American mealies; samples of which vary considerably. The veld is infested with a small black beetle, which, however, does not appear to be doing any harm—though what they subsist on is a mystery—and one is inclined to think they are not here for any good. A small flight of locusts passed through the Division without doing any

harm as far as I know. Several farmers are now using the disc plough, but their evidence is divided in favour of this or the better class mould-board plough; but all are of one opinion that the plough can be greatly improved in many respects. At a recent meeting of the Farmers' Association it was resolved that members should not take each other's Native kraals on to their farms when these have been turned off for misconduct. It is to be hoped members will see this important resolution carried out. Rainfall since the first of the month, 1·6 inches.

CHAS. R. SKOTTOWE.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—

The only pleasing matter to note, and one which will be welcomed throughout the farming community, is the rain. So far, November has been a fairly wet month throughout South Africa; and one may now say, without fear of contradiction, that the drought is broken up. Trade does not show the improvement one would wish, but, should the season now commenced continue wet, matters will right themselves.

Mealies.—During the past fortnight Natal mealies have been disposed of in the market at prices varying between 7s. 7d. and 15s. per 100 lbs. The latter price was for grain good enough for seed. The American mealies realised from 13s. to 16s. per muid in Durban. There is a demand for Natal mealies for planting.

Forage.—Good, dry, baled forage is in demand, but prices are somewhat easier. Prices have fluctuated between 3s. and 5s. 9d. per 100 lbs.

Hay.—The market is not well supplied, and the little offered is far from first class—from 1s. 3d. to 1s. 5d. per 100 lbs. Bedding realised from 10s. to 15s. per load.

Potatoes.—New potatoes are coming forward, and realise good prices. Some samples have been as low as 10s. 6d., 12s. 6d. and 17s. per 100 lbs.; but good tubers have realised from 20s. 3d. to 23s. and 26s. 9d. per 100 lbs.

Sundries.—Mutton, from 6d. to 1s. per lb.; pork, 3d. to 8½d. per lb.; brawn, 7d. to 8d. per lb.; sausages, 4d. per lb.; colonies, 7½d. to 8d. per lb.; pigeons, 2s. 1d. to 3s. 3d. per pair; rabbits, 2s. 3d. to 2s. 6d. each; lard, 10d. per lb.

Fruit.—Bananas, grenadillas, grapes, lemons, limes, oranges, naartjes, mangoes, peaches, plums, papaws and pineapples.

Vegetables.—It is a long time since the market has been so well supplied as at present; the recent rains have certainly improved matters. Every morning for some days past beans, beet-root, cabbages, carrots, celery, cucumbers,

eschalo's, herbs, leeks, marrows, mushrooms, peas, parsley, parsnips, radishes, rhubarb, have been sold in considerable quantities.

Firewood.—From 6½d. to 11d. per 100lbs.; cut from 11d. to 1s. per 100lbs.

Tobacco.—About 1s. per lb.

Beans.—From 24s. 3d. to 26s. 9d. per 100 lbs.

Onions.—First-class onions are selling at good prices, the average being about 13s. 6d. per 100 lbs.

Mabele.—The only samples offered are imported. Good Colonial grown can scarcely be obtained.

Poultry.—Very little offering at present. Common fowls from 1s. 8d. to 4s. 9d. each; turkeys (cocks), 15s. 6d. to 22s. 6d. each. (hens), 10s. 6d. each; ducks, 6s. to 9s. 3d. per pair.

Eggs.—Still coming forward in fairly large quantities, and prices have realised from 1s. 6d. to 2s. 5d. per dozen.

Butter.—Prices are more in favour of the purchaser than they were a short time back, some morning's prices being as low as 1s. per lb., on others from 1s. 6d. to 2s. per lb. being realised.

DURBAN.—Our usual special report has not reached us. The following is extracted from the *Mercury* of the 26th inst.:—Bananas 1s. to 2s. 6d. bunch, ditto 1s. to 2s. 3d. per 100, beans 1s. to 3s. 6d. per basket, butter (fresh) 1s. to 1s. 5d. per lb., butter 9d. to 10d. per lb., cabbages 3d. to 4d. per doz., cauliflowers 1s. 3d. per doz., cucumbers 2s. to 3s. 6d. per doz., ducks 4s. 6d. to 7s. 1d. each, eggs 1s. 10d. to 2s. 4d. per doz., fowls 1s. 10½d. to 4s. each, grenadillas 2s. per 100, lemons 2s. 6d. to 4s. per lot, limes 1s. 9d. per 100, mangoes 6s. per 100, milk 4d. per bottle, mushrooms 5s. per basket, onions 2d. to 2½d. per lb., oranges 5s. to 11s. 6d. per 100, papaws 1s. to 1s. 9d. per doz., peas (green) 2d. per lb., pigeons 1s. 6d. each, pineapples 3s. to 4s. per doz., potatoes (round) 22s. 6d. per muid, pumpkins 18s. per doz., strawberries 4d. per tray, tomatoes 8s. per basket,

JOHANNESBURG—Mr. W. H. Thomas, Box 1960, writes:—

Owing to the continued depressed state of business in general, the produce market is naturally also affected, and to such an extent that sellers simply sell to realise in order to meet their liabilities. Produce is often sold from 10 to 20 per cent. below landed cost. Prices are as follows:—

Barley for Seed at per 163 lb. bags.—Very little has been offered for sale; from 15s. to 18s.

Barley, green, for forage, per 100 bundles.—This is getting scarce and indifferent; from 20s. to 30s.

Bran per 100 lb. bags.—Not much offering, but still, that which is offered realises very badly, although not Colonial Wheat Bran, but still ground in the Colony. 8s. to 8s. 3d. American Bran, 7s. to 7s. 6d.

Bales Chaff, per 100 lbs.—Plenty is being offered; Cape Colony still realises pretty well; 4s. to 5s.

Mabele, per 203 lbs.—No South African Corn offering. Only Indian white at 20s, 21s. 6d. Indian Pale Red, 21s., 21s. 6d., and Indian Red Kurrahee, 22s., 22s. 6d.

Mealies, per 203 lbs.—A few bags South

African have been sold for seed. Yellows, 24s., 26s. Whites, 25s., 27s. South American Yellow, 15s. 6d., 17s. 6d. Whites, 17s., 18s. North American Whites, 20s. 6d., 21s.

Oathay, per 100 lbs.—As there is any amount of local forage coming forward, other forage is almost out of our market. Local realises 8s. 6d., 10s. Other from 7s. 6d., 8s. 9d.

Onions, per 127 lbs.—Last week there was a run on this line, which realised better than at any other time during the season. As much as 35s. per bag being got, but this week coming back again, 22s. 6d., to 25s.

Potatoes, per 163 lbs.—As our local potato growers are now lifting their new crops, the market is crowded daily, and the prices have fallen to 15s. per bag in one week. To-day (21st November) is the biggest market we have had for some time now. About 1,500 bags were sold. Prices 12s., 15s., 20s., 22s. 6d., 24s., 26s.

Eggs.—*Fresh*, per doz., 3s., 3s. 9d. *Colonial*, 2s., 2s. 6d. *Imported*, 1s. 1s. 6d.

Ducks.—*Each*, 7s., 8s. *Fowls*, 2s. 6d. to 3s.; 2s. to 5s. *Geese*, 8s. 6d., 10s. *Turkeys*, *Hens*, 12s., 15s. *Turkeys*, *Gobblers*, 22s. 6d., 27s.

Pound Notices.

THE following stock, unless previously released, will be sold on the 6th day of January, 1904:—

Hope Farm, Division of Newcastle.—Seven sheep, viz.: 3 hampels, 2 ewes, 2 lambs; dark grey mare, about 14 hands; 17 mixed Kafir goats.

Newcastle.—Running on the farm Munroe Winkel—Red cow, white stripe on back, no brands, and black calf, with grey face.

Dundee.—Running on the farm "Bonney"—Bay mare, left foot white, both eyes white and blind in left, branded F F on right buttock.

Berlin, Division of Newcastle.—Bay gelding, about 15 hands, branded A. Grey gelding, thickset, about 14 hands.

Nqutu.—Bright bay gelding, 14-3, black points, slit in near ear, tip off other ear.

Pomeroy.—Kafir sheep ewe, black body, brown under, no ear marks. Two woolled sheep, ewes, branded AV (joined), and PN. Two woolled sheep, ewes, branded AV (joined). Two woolled sheep, ewes, lambs, no brands.

Running on the farm "Isibindi," Helpmakaar.—Black mare, about 2 years old and about 13-2 hands high, no marks.

Greytown.—Black heifer, white tail and under belly, long slit in point left ear, square cut under right ear, age about 4 years, no brands visible; red heifer, white head and cheeks, little white on brisket, white brush, square cut under left ear, age about 4 years, no brands visible.

Running on the farm "Balmoral," Reit Vlei.—Light bay filly, left hind foot white, about 3 years old.

Highbury.—Black goat, ram, impounded on September 29th by Gwiji. The above animal

will be sold at the expiry of one month from this date (November 16th) if not previously released.

Weekly Rinderpest Report up to 24th November, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 28th May, 1903, to date.
<i>Zululand.</i>			
Eshowe District	3	13	342
Umlalazi District	4	9	188
Nkandhla District	2	1	309
Mahlabatini District ...	3	5	194
Entonjaneni District ...	6	9	47
Nqutu District...	6	...	9
<i>Vryheid District.</i>	1	2	236

S. B. WOOLLAT, F.

P. V. SURGEON,

P. V. Surgeon's Office,
24th November, 1903.

The Agricultural Journal

AND MINING RECORD.

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FRIDAY, DECEMBER 11, 1903.

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Judging at Shows.

R.A.S.E. AND CANADIAN PRACTICE.

WITH much gratification we publish the following letters. However highly qualified are the writers, letters of such character make a demand on time and consideration that may well be flinched from by those who are in eminent positions, and whose duties involve much responsibility and constant attention.

The desirability of improving the judging at our Shows we have put forward with some diffidence, but with the conviction that our contention was not open to reasonable contradiction. Confirmation in correspondence we received from practically all the Judges of the Colony's premier Show—that of Maritzburg.

In Shows, everything depends on the

judging. It is the very foundation of Shows. If the judging is inefficient, Shows are useless from an educational point of view, and may be mischievous. The Legislature annually votes £3,500 for Shows, and the only justification for the vote is that it is for an educational purpose.

The letter which follows is from the Secretary of the R.A.S.E. ; we would draw especial attention to the second paragraph.

Royal Agricultural Society of England,
13, Hanover Square,
London, W., October 7th, 1903.

Dear Sir,—In reply to your letter of the 11th August last, I have the pleasure

to send you herewith copies of the prize-sheets for the Show of this Society held at Park Royal last June, as well as various other printed papers used in connection with the judging of live stock at the Society's Shows. The stock prize-sheet at pages 40 and 41 gives the general rules governing the procedure of the judges and stewards in the showyard.

The judges are appointed by the council on the recommendation of a Special Judges' Selection Committee, consisting of the members of the Stock Prizes Committee and the stewards of the several departments. For the assistance of this Committee, lists of judges considered competent to judge the respective breeds are drawn up from time to time from names submitted by members of the Society and by the different Breed Societies; but the Committee are in no way fettered in their discretion as to the persons that shall be invited to judge.

For many years each different breed of live stock has been judged by two judges with a reserve judge as umpire, in cases where the two judges disagree. This year at Park Royal, the principle of "Single Judging," i.e., only one judge for each breed of live stock, was adopted.

Each judge is required to write a brief report on the classes upon which he adjudicates. The substance of the reports thus received is incorporated in the official report on the Show, included in the Society's journal. I am sending a separately printed copy of the report on the Cardiff Show of 1901, as an indication of the kind of reports received.

Judging by "points" is not practised for pedigree live stock at Agricultural Shows in the United Kingdom. The system has, however, had its advocates; and in one or two cases it has been tried, but abandoned as impracticable.

Some of the Breed Societies issue in their herd or flock books descriptions of the standard to which it is desired that specimens of their breed should attain; and some, like the Southdown and the Suffolk Sheep Societies, include in their flock books "Scales of Points" of an optional character for the guidance of those who like to use them.

The first volume of the English Jersey

Herd Book, published in 1879, contains at pages 45 and 46 a scale of points for the judging of Jersey cattle.

A copy of the scale of points issued by the Southdown Sheep Society will be found in the parcel of printed papers above referred to, and which are sent by this mail under separate cover.

In the Society's Horse Shoeing Competitions, a form in which points are used is supplied for the use of the judges. (See specimen).

Yours faithfully,

ERNEST CLARKE,
Secretary.

Editor, *Agricultural Journal*,
Pietermaritzburg, Natal.

Anxious as we are to see improvements in the methods of judging, or adaptations of improved systems suitable to the farming conditions of the Colony, we recognise that the first step necessary is that of the classification or appointment of the Judges. In matters of this character, which involve the consultation or challenging the opinion of many, the question submitted should be clear and simple. Among the propositions advanced by our correspondents to attain this end, we think that of Mr. D. C. Dick, Vice-President of the Maritzburg Agricultural Show, deserves much consideration. Mr. Dick wrote, page 485, Volume VI., "I think that some move should be made by the Agricultural Societies to establish an 'Association of Judges of Stock and Produce,' and that before any individual should be allowed to become a member of such Association, he should be approved by a committee (consisting of a delegate from each Agricultural Society of the Colony), as a fit and proper person capable of performing the duties of a Judge in whatever class he may prove to have a knowledge of." Here, at any rate, is a clear and simple proposal. It is one that, in its broad principles, should, we think, commend itself to all who have the interest of Shows, and consequently of farming generally, at heart.

The following letter shows how judging is managed in the great agricultural

Province of Ontario, Canada. The Fairs or Shows are subsidised by the local Government. Until recently, the management of the Fairs was extremely slack; the support of the respective farming communities dwindled to practically nothing; in many instances horse racing became a leading feature, and the educational aspect disappeared almost altogether. All has been reformed. The subsidies were in peril, and to save the situation the claims of the educational side of the question were generally admitted. The aid of the Department of Agriculture was invoked. This was readily given, and as we have shown in a recent issue, the Fairs are now legitimately attractive. And how has the reform been accomplished? The answer is simple. The judging is done by competent and impartial men, and men who can and are willing to give their reasons for their awards. The latter feature in the judging is found to be extremely popular, and besides helping the "gate," fulfills in the highest possible degree the educational requirements which should, of course, be the first object of every Agricultural Show.

Ontario Department of Agriculture,
Toronto, October 24th, 1903.

Editor, *Agricultural Journal*,
Pietermaritzburg, Natal,
South Africa.

Dear Sir,—I am in receipt of your letter of August 11th, *re* Judging at Fairs. In reply I would say that our Judges have just returned from their fall trips, and report good work done.

We appointed Judges for horses, cattle, sheep, swine and poultry at 152 Fairs in the Province of Ontario. We organize our Fairs in circuits in order to economize the time of the Judges. As a rule the same Judges attend from four to six Fairs a week. We pay them from 2.50 to 3.00 dollars a day and all expenses. Once a year we hold a judging class, which lasts two weeks, and the men receive instruction along the lines of expert judging, with the different breeds of cattle before them and with a special instructor, who is careful to point out the marked re-

quirements, etc., of the animals in question.

The men for judging are selected by myself, and as they are for the most part large farmers at home they will work at a very low rate in order to get an opportunity to visit the different parts of the Province at our expense. They are also loyal Canadians, and feel it their duty, as far as possible, to assist their fellow farmers.

We are now sending our report for 1903 to the press, and I shall be very glad to send you this as soon as it is published. The last report was sent you a few days ago.

Yours very truly,

G. C. CREELMAN.

It will be seen by Mr. Creelman's letter that he, in his capacity of Superintendent of Farmers' Institutes and Agricultural Societies, selected the Judges. Doubtless he has excellent advice available, but the responsibility is great, and such as would not be generally envied in this Colony. For our own conditions the plan roughly sketched by Mr. Dick, and corresponding in its broad aspects with that of the R.A.S.E., it is probable, would be the best plan. Again, it has the advantage, according to British sentiments, of being voluntary and non-official.

When the question of appointment of Judges has been decided, the other questions which we and our correspondents have raised—explaining the reasons for awards, single judging, judging by points, etc.—can be more profitably discussed.

What is now wanted is action, and we venture to suggest that the first move should be made by the Maritzburg Agricultural Society. To be a member of a Society of Judges registered under such auspices, and entitled to certain privileges and consideration, will be a matter of satisfaction to those Judges who have already established their reputation, and who, as a matter of course, will be the first to be appointed. To become one of that body will also be a just and laudable ambition for hundreds of young Colonists. When once the initial stage has been passed the organisation will work itself.

Passing Notes.

BACTERIOLOGY.—Both in animal and plant life, bacteria have such important functions that we feel sure the elementary paper on the subject which is published in this issue will be found of interest by many of our readers. The lecture was delivered by Dr. E. Paget Thurstan, B.A., M.D., Cantab at an extension course of the Adelaide University. The treatment of a difficult technical subject with clearness for the average reader is a difficult matter, and in this instance we think it will be admitted that the Professor has succeeded. Perusal of the article will enable a better grasp to be got of the difficulties, even the elementary difficulties, which attend research work, work, such as that upon which Dr. Koch and other scientific men are now engaged on African Coast Fever. Regarding the important discoveries of Dr. Koch for the separation of the different species of bacteria, Dr. Thurstan gives a very clear explanation. By acquiring a conception of the A B C of bacteriology, Colonists will gain some perception of the work being done by Mr. Watkins-Pitchford and his collaborator Dr. Watkins-Pitchford at the Allerton Laboratory.

MOTORS FOR FARM WORK.—An esteemed and well-known farmer has been good enough to send us the article on motors for farm work which will be found in another column. Our correspondent in his covering letter says he believes that the power for farming will very shortly be that of motors in the O.R.C. and the Transvaal, a change which will be due principally to losses in oxen from African Coast Fever. Mules and horses for farm power, he is of opinion, will cost more than motors. He continues:—"Every season will see many improvements in these machines, and if only English manufacturers would send out agents to push these motors and *explain the practical working of same*, they would not only secure the trade, but benefit this country as well as the Old one. These machines in a few years are going to revolutionise ploughing and other such operations on the farm, thus leaving the thousands of bullocks now at work to fulfil their

proper destiny in this world—by becoming beef."

MOSQUITOES.—On another page will be found a series of instructions for the destruction of mosquitoes published by the U.S. Department of Agriculture. The instructions are clear and eminently practical. On the Coast they should prove of the greatest service, but throughout the whole Colony they are deserving of attention, for the districts that are entirely free from the mosquito pest are few and far between. It is now established that neither the sting nor the buzzing of mosquitoes are their worst attributes. The faculties of mosquitoes in the conveying of disease are most to be feared. As regards one disease, malaria, it is proved beyond doubt that a certain mosquito, if it has fed on a person having the malarial germ in his blood, conveys that disease to healthy people. Protection from the mosquito in malarial countries means freedom from malaria. The mosquito is suspected of similarly transmitting other diseases, and with respect to several, the evidence is practically conclusive. Again, the experiments and research work of Mr. Watkins-Pitchford go to show that the mosquito is the agent in the conveying of that South African scourge at the period of the year now at hand—horsesickness. It is desirable to stable horses and mules when the mosquito is abroad, and to close the openings to the stable with gauze, or to have smudges burning near horses that cannot be housed, but best of all it would be to rid the vicinities from mosquitoes. The instructions referred to, if carried out, should go far in that direction.

CHERRIES.—In a personal letter to the Editor a correspondent incidentally expresses surprise that prominence should have been given in the last issue to the growing of cherries. He says they grow as well at Mooi River as they do in England. He has never seen better grown anywhere. All that the cherry wants, he says, is proper irrigation and protection from birds. So much for Mooi River. On the other hand, we give the following testimony to the difficulty in getting a

certain cherry-tree to fruit. Our informant lives in the "mist belt." He had a cherry tree about twelve years old; year after year it would give a splendid show, but a show which never matured. One friend recommended a certain kind of branch pruning. No better result. Another, next year, recommended a different kind, and yet no better result.

Another recommended gentle root pruning, and still no better result; another on the following year, advised cutting off all the roots on one side, but still there was no fruit. Last year at the suggestion of another friend he hammered a large lot of big nails into the trunk, and still there were no cherries. This is probably an exceptional tree in many respects.

Bloemfontein Veterinary Conference.

REPORT TO THE MINISTER OF AGRICULTURE.

MINISTER OF AGRICULTURE—

IN accordance with the wish of the Government, we left Pietermaritzburg on the night of November 30th, and arrived at Bloemfontein mid-day on December 2nd to attend the Veterinary Conference.

The Conference met in the railway offices at 10 a.m. on December 3rd, and was opened by the Acting Lieutenant-Governor.

Lieutenant-Colonel Flintoff, P.V.S., O. R. C., was appointed chairman. At the outset, a discussion took place as to the agenda to be laid before the Conference, and it was decided, while dealing primarily with rinderpest, that a sub-Committee be appointed to decide what other subjects should be dealt with by the Conference.

A lengthy discussion on rinderpest occupied the whole of the first day and a part of the second. The Conference sat from 10 a.m. to 1 p.m., and from 3 p.m. to 5 p.m., the sub-Committee sitting from 2.15 to 3 p.m.

After full debate as to the best method of dealing with rinderpest, the Conference unanimously agreed upon the use of pure serum as an immunising agent incapable of conveying the disease, as such was the only permissible application of the method. The advantages of the bile method were fully admitted, Dr. Koch maintaining that pure bile did not carry infection, and was, therefore, the best agent to use. The Natal and many of the other delegates were convinced that, in many cases, pure bile did carry infection.

A discussion as to the "length of time

the contagium remained active after the last sick animal had recovered, or had died," resulted in an expression of opinion from the majority that the infection soon became extinct (within some 21 days).

At the conclusion of the discussion on rinderpest, the following resolutions were adopted:—

1. The conditions existing at the present moment are particularly favourable for the immediate adoption of concerted measures to eradicate rinderpest in South Africa, and that the means best suited to attain this end are the stamping out of outbreaks of rinderpest by a liberal use of serum, if obtainable; failing which, pure bile inoculation, carried out under professional supervision, is preferable to any other method. Further, that in the interests of South Africa generally those Colonies having serum reserves, should offer to supply at cost price other Colonies, insufficiently provided, who require serum to cope with pressing outbreaks.
2. That this Conference is of opinion that one of the most important points in preventing the spread of rinderpest or any other contagious disease is the making of an immediate and correct diagnosis, and that in order to accomplish this, each Colony or Protectorate should maintain an adequate staff of trained veterinarians.
3. That all Governments represented at this Conference bind themselves to at once give notice of every outbreak of

rinderpest in their country, even in single cases, to the other Governments.

The main business laid down by the sub-Committee was that the discussion should take place on the following diseases :—

East Coast Fever.
Lungsickness.
Glanders
Epizootic Lymphangitis.
Mange in horses.
Foot and mouth disease.
Scab in sheep.
Swine fever
Specific ophthalmia.

On the second day (4th) the Conference met at 9 a.m., and sat till 5 p.m., with an interval for lunch.

After the discussion on Rinderpest had closed, Dr. Koch opened the discussion on East Coast Fever by a lengthy general statement on the disease, bringing forward many points on which other observers were distinctly at variance with him, such as :—

- (a) species of tick responsible for transmitting the disease, Dr. Koch stating that, in his experience, it was the blue tick.
- (b) Necessity for quarantine. Dr. Koch did not consider such a measure advisable.
- (c) Advisability of inoculating by his method.
- (d) Dissemination of the disease throughout South Africa ; Dr. Koch holding that it would be general.
- (e) The existence, more or less, of the disease along the whole of the East Coast of Africa, from East London upwards, Dr. Koch even stating that it was probable that the disease had been introduced into the Transvaal through Durban, as well as through Beira and Delagoa Bay.

Regarding the above points raised by Dr. Koch, it was shown that the disease had undoubtedly been produced (experimentally) by the adult Brown Tick in Capetown, and that Dr. Theiler had also produced it with the "Nymphal Stage" of the Brown Tick. The Conference was unanimously and strongly of opinion that quarantine measures were advisable and

necessary, as the tick did not travel ; but, that to make such measure complete, recovered animals should not be permitted to leave an infected area.

The carrying of the resolution regarding fencing, demonstrated the opinion of the Conference that quarantine regulations are essential.

It was considered that the disease would not become permanent in those districts of South Africa unfavourable to the life of ticks.

The opinion was strongly expressed that Dr. Koch's inoculation should only be carried out in infected areas.

The Natal and Cape Colony delegates pointed out the impossibility, at the present time, of Coast Fever existing along the Natal or Cape Coast. It was shown that not only had no restrictions been placed on the removal of cattle from the Coast districts, but that such movements had been considerable, resulting in no spread of the disease, and that Coast cattle from Natal had readily died of the disease in Rhodesia.

Dr. Koch was of opinion that dipping was quite a secondary consideration, and the Conference agreed, that, in dealing with troops already infected, unless such troops were moved to clean veld, dipping was of no practical value. Mr. Gray (Rhodesia) brought forward evidence to show that dipping, even after infection of the troop, considerably reduced the mortality. The Conference agreed that the dipping or spraying of transport and other cattle, if systematically carried out, was of considerable value. Several of the members of the Conference spoke strongly on the necessity of considering the expediency of adopting measures for the eradication of ticks. It was pointed out that, apart from the general well-being of cattle and the disease of East Coast Fever, other diseases now causing loss would, by dipping, be held in check, and a unanimous resolution was passed on this subject.

The following resolutions were passed regarding East Coast Fever :—

4. That this Conference is of opinion that the best means of preventing this disease is the fencing of infected farms ; and that the various Govern-

ments should be recommended to carry this out.

5. That, in isolated cases, the cattle should be destroyed, the owners compensated, the veld fenced and quarantined for a sufficiently long period, the cattle in the vicinity being dipped or sprayed.

On the afternoon of the second day and the morning of the third day, discussion took place on the following diseases :—

6. *Lung sickness*.—Regarding this, the Conference was unanimously of opinion that all affected animals should be destroyed, and that the period of quarantine should be at least three months from the last appearance of the disease.

7. *Glanders*.—The Conference was of opinion that the mallein test should be applied. Dr. Koch pointed out that the agglutination was more reliable than the mallein test, and the Conference recommended an investigation into this matter.

8. *Epizootic Lymphagitis and Swine Fever*.—These diseases were recommended to be scheduled as contagious. It was stated that swine fever existed in the Cape and Transvaal Colonies.

9. *Foot and Mouth Disease*.—A short discussion on this disease took place. Dr. Hutcheon was of opinion that this disease existed in an epizootic form in South Africa. The Natal delegates did not agree.

10. *Mange in Horses*.—The loss caused by this disease, and its general spread since the war, were pointed out, and it was recommended that it should be scheduled as contagious, and be dealt with in a similar manner to sheep scab.

11. *Rabies*.—This was also discussed. Mr. Gray pointed out the advantages of the muzzling regulations, and stated that 60,000 dogs had been destroyed in Rhodesia. He pointed out the possibility of the disease still existing in the wild carnivora there.

12. *Sheep Scab*.—The necessity for a general Act for this disease was pointed out. The use of authorised dips and dipping under supervision were discussed, but it was agreed that the most important factor was that of guarding against re-infection.

13.—In view of the extremely useful information elicited by the Conference, and of the benefits which it was felt that all present had derived from the various discussions, it was proposed to recommend to the various Governments the advisability of convening another Conference within a period of twelve months, for the purpose of taking up matters with which the present Conference was unable to deal, and for the revision and codification of inter-Colonial Stock Laws. Cape-town was suggested as the most suitable place, and it was decided to recommend that a sub-committee, consisting of the P.V. Surgeons of the various Colonies should meet within six months and discuss the various regulations and subjects to be submitted to the Conference, in order that an agenda might be in readiness.

The Conference broke up at 1 p.m. on the 5th inst.

H. WATKINS-PITCHFORD,
Government Bacteriologist.

S. B. WOOLLATT,
P.V. Surgeon.

8th December, 1903.

The truth of the following Collie story has been guaranteed by the late Robert Louis Stevenson, in his relation of how John Todd, a shepherd, refused an offer of £40 for his Collie. John had bought some sheep in Edinburgh, and, when leaving the town, the road being crowded, two were lost. The loss of the sheep was a reproach to John and a slur on the dog. Word came after some days that a farmer about Braid had found a couple of sheep, and thither went John and the dog to ask for restitution. But the farmer was a hard man, and asked, "How are they marked?" John could not tell. "Very well," said the farmer. "I shall keep them." Then said John, "It's true that I canna tell the sheep; but if my dog can, will ye let me hae them?" The farmer was honest as well as hard, and, besides, he had little fear of the ordeal. So all his sheep were driven into a small field, and John's dog, who knew his business well, was turned in among them. He knew that his master had bought two sheep, for he had looked on while the purchase was made, and, to his shame, had lost them above Boroughmuirhead. Without pause or blunder he singled out first one and then the other. It was that afternoon the £40 was offered for the dog and refused.

Mosquitoes.

A "CARD" ISSUED BY THE U.S. DEPARTMENT OF AGRICULTURE.

YOU are responsible for the mosquitoes in your own house and dooryard. Read these Rules carefully.

1. Mosquitoes breed *only* in water; usually fresh, standing water in artificial places.
2. Mosquitoes occur in the vicinity in which they breed. Invasions from long distances are exceptional.
3. The young mosquito or "wiggler" lives in water at least 10 or 12 days.
4. Although the wigglers live in water, they *must* come frequently to the surface to breathe.
5. Coal-oil on the surface of the water prevents the wiggler from breathing.
6. Destroy the breeding places and you will destroy the mosquitoes.
7. Empty the water from all tubs, buckets, cans, flower pots, vases, etc., once a week.
8. Fill in or drain all pools, ditches, and various excavations, as post holes left unfilled, etc.
9. Change regularly every week all water needed in chicken-coops, kennels, etc.
10. Treat with coal-oil all standing water which cannot be screened or drained (1 oz. of oil will cover 15 square feet of surface). The oil does not affect the water for use if the water is drawn from below.
11. Put wire-netting over cisterns, wells and tanks of water in every-day use.
12. Places in which it is undesirable to place oil, such as watering troughs for stock, lily-ponds, etc., can be kept free of the wigglers by putting gold-fish. The nymphs of dragon flies and tadpoles of frogs also feed on the wigglers.
13. See that the plumbing about the place is in perfect order. Prevent leakage of pipes or clogging of eaves.
14. Inspect all cesspools and see that the covers are *absolutely* tight.
15. Clean away all weeds, grass and bushes about ditches, ponds, and other possible breeding places, since these afford a hiding place for the adult mosquitoes.

16. Clean up vacant lots and back yards of all cans, tins, bottles and rubbish.

17. First do away with or treat all places where mosquitoes are known to breed, and then begin work on places where they might breed.

18. As a citizen of your community, you should feel a personal responsibility for the destruction of the mosquitoes in your district, and seek to co-operate with your neighbours in the work of doing away with breeding places. Inspect and treat with coal-oil gutters, culverts, ditches, man-holes, catch-basins, etc., along the roadside. Man-hole covers should be screened.

19. Where oil is applied to standing water it must be distributed evenly over the surface. Use a hand syringe, or, if the area is great, a knapsack sprayer.

20. Houses should be cleared of all winged mosquitoes by the burning of insect powder. The mosquitoes will fall to the floor, and should be collected and burned.

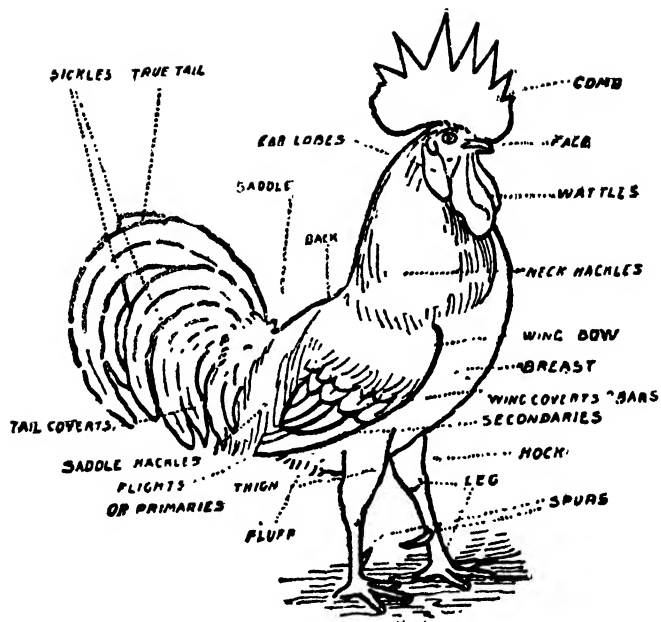
21. Relief in any community or district depends entirely upon the co-operation of the members of the community.

D. L. VAN DINE,
Entomologist Hawaii Expt. Stn.

Honolulu, September 14, 1903.

PRINTER'S ERROR.—In our last issue the words "natural size" were unfortunately transposed in the illustrations of cherries. The words should, of course, have appeared under the first illustration.

A machine for wrapping oranges and other fruits with paper has recently been perfected and is being installed in some of the large orchards and packing sheds of California and Florida. The machine is run either by hand or power and has a capacity of 25,000 to 40,000 oranges per day. The paper is fed from the endless roll and the machine will wrap fruit from the size of marbles upwards and will handle eggs without breaking them. With such a machine the cost of wrapping is much reduced.



THE POINTS OF A ROOSTER.

Our sketch, from the "Waverley Poultry-book," published by Messrs. A. Dobbie & Co., Leith, is designed to teach the poultry-keeper the technical terms applied to the different parts of a fowl.

Bacteriology.

ITS ORIGIN AND PROGRESS.

A lecture by Dr. E. A. P. THURSTAN, Adelaide University.

LADIES and Gentlemen, Bacteriology (that is, the study of bacteria) is the youngest-born of the sciences, but the sturdy babe has thriven so wonderfully that in a very few years it promises to outbid all the others in importance.

Practically the science dates from Pasteur, Lister, and Koch—a Frenchman, an Englishman, and a German; men contemporary with most of us here. The knowledge of it has barely had time to permeate all classes and parts remote from the old centres of civilisation, but its influence is truly wide-spread. It has its own literature, its magazines, its museums, laboratories, and institutes. Almost every trade has acquired new and valuable information from bacteriologists—especially some that deeply concern this State, such as wine-making, farming, and dairywork. Countless lives have already been saved by it, and they are as nothing to the possibilities of the future. Surgery has been profoundly modified by its influence. In its hands seems to lie the future medical treatment of many diseases now only curable by that sharp remedy, the surgeon's knife.

It is a very difficult task to so shape these lectures as to avoid all technicalities. Sciences are interwoven to such a degree that it is difficult to understand any one of them without some knowledge of the others. Some of my hearers are, possibly, unacquainted with any of the sciences; moreover, it is plainly impossible to teach a science in the course of three lectures. I propose, therefore, to use as few technical terms as possible, and explain these in the simplest phrases at my command. Though I cannot make you all accomplished bacteriologists, I can enable you to acquire a comprehension of facts of the deepest importance to every member of the community, as I am sure you will allow, if you have the patience to follow me through the course. I take it, the object of these series of

lectures is educatory, not merely interesting. Education (from *educō*, I bring forth) means a bringing out of the faculties—thought, reflection, reasoning, deduction, comparison. All these I hope to stimulate by the story I have to tell. A few big foreign-sounding words you must be prepared to hear. Do not misunderstand them, like the untravelled Englishman, who, hearing a Frenchman exclaim "Comment!" took it for a challenge, replied "Come on," and promptly struck the first blow.

For many centuries observers were acquainted only with such objects as are visible to the "naked eye." So little did people travel that they were sceptical about many things that are familiar enough now. The Romans had a proverb about rare things being like a black swan, though there were plenty of black swans in the world then if they had only known it. It was next to impossible for stay-at-home people to discriminate between true tales and the de Rougemontesque of travellers. You remember the well-worn story of the old mother who believed her sailor son's account of the rivers of rum and mountains of tobacco, of the wheels of Pharaoh's chariot that the anchor brought up in the Red sea, but could not swallow the tale of fish that flew. When the invention of the telescope enabled men to realise that the universe consisted of tens of thousands of worlds, many far bigger than this, and flashing suns beside which ours was a pigmy, it certainly widened the human outlook. But this in no way prepared people to realise that the earth contained, besides all the plants and animals, countless billions of minute organisms which occupied the air we breathe, the water we drink, the substance of every body, the soil of the field and garden, and the dust of the city, and yet had for centuries been hidden from our view.

More than two hundred years ago a

Dutch draper named Leeuwenhoek amused his leisure by grinding lenses, which were practically the beginning of modern microscopes. By the aid of his new instrument he was able to see what no human eye had ever gazed on before. It was like Columbus looking at America. You can picture his amazement and delight. From that time the microscope has undergone continuous improvement, until now it can magnify nearly 2,000 times. A tiny thing one micro-millimetre long—that is, only the twenty-five thousandth part of an inch, when magnified a thousand times seems as if it were the twenty-fifth of an inch in length. Now a man can divide an inch into twenty-fifths with his hand without the aid of any instrument, and see the spaces between the lines without the help of a magnifying glass, so the inconceivably little has become plainly visible. You must try and realise how small these dimensions are, or you will be unable to grasp one of the cardinal points of bacteriology. If such bacterium was one twenty-five thousandth of an inch long (and the influenza bacillus, for instance, is far smaller than this) then in a drop one twenty-fifth of an inch across, hanging we will suppose from the point of a needle, there would be a thousand germs in each diameter, and the whole drop would contain more than 500,000,000—a hundred and thirty times the population of all Australasia, say in one tiny drop.

What did the workers with the wonderful magnifying lenses see? In almost everything Leeuwenhoek examined he saw little shapes, many of them darting about in various directions—very much alive apparently. Can you wonder that these minute organisms were mistaken for animalcules? Now, however, we believe that they are plants not animals, though popularly they are spoken of still as if they were alive, just as we speak of the sun rising and setting, though we are satisfied it does nothing of the kind. All these little bodies are called generically "bacteria." Different writers classify them in various ways, but usually there are recognised three main divisions, arranged according to the *shape of the bacteria*. The first class is named

"bacilli," from *bacillus*—a rod. Some bacilli are relatively thin, others are almost as broad as they are long, but still distinctly longer one way than the other.

Each division has numberless subdivisions. Very often, especially when the little organisms cause illness when gaining access to a living being, it is named after the disease it produces, as the "Bacillus Anthracis," the bacillus of *Anthrax* or woolsorters' disease. The next class is known as "Cocci," from *coccus*, a kernel—plural cocci. They are like minute balls, or so many tiny eggs. These are frequently named after the manner in which the little individual globes are grouped together. When these are arranged in pairs they are called "diplococci"; when three or four are strung together in chains they are called "streptococci" from *strepton*, a chain; when in bunches like grapes they are "staphylococci," from *staphule*, a bunch of grapes. Sometimes they too get their name from the disease they cause, as "pneumo-coccus," the coccus of pneumonia. The bacilli multiply by spores or seeds which form inside of them. The cocci increase by dividing into two. Possibly the diplococci or cocci in pairs, and the streptococci in chains, are really cocci in process of sub-division. Anyway, you will seldom find all your cocci of one pattern. There is a species called "Sarcina," or the woolpack, which is arranged in cubes two long, two broad, and two deep—eight together. The bacilli often have fine filaments at one end or both, known as "flagellae" or "whips"; the cocci do not have these flagellae. The third group is known as "spirilla"—spiral or corkscrew like, with a spiral movement. These multiply by spores and not by division; that is as far as the microscope can take us. The early observers were so eager in searching for new forms that they overlooked any other possible means of identifying them, and we come down to quite recent times before we get any satisfaction. Before going on to describe the processes now adopted I will give you a slight historical sketch, which will, I think, be interesting, and at the same time will lead you gradually up to the modern standpoint.

Quite a host of theories were advanced and disproved in course of time. In following up or opposing these, observers hit upon one fact after another which gradually fitted together and made the mosaic complete. One of the first puzzles to early observers was: "How came these micro-organisms there?" Many asserted that, seeing how impossible it was to exclude them, they must hatch out of themselves, that there must be *spontaneous* generation. Others asserted that out of nothing nothing came, and that there must be some original germ which produced the others.

In 1776 an Italian named Spallanzani claimed to have solved this problem. He boiled liquids such as broth, which under ordinary circumstances readily decomposed, in a glass flask, and sealed up the end while the contents were boiling. As a rule no life appeared in the liquid even when kept for months. Sometimes, however, notwithstanding his care, the contents of his flask went bad. This failure we now explain by supposing that in these cases Spallanzani had bacilli or spirillae as well as cocci in his flask. While the boiling heat destroyed the germs it did not destroy the spores of the bacilli, and later on these fructified. However, in those days, nothing was known of the existence of spores, and consequently no explanation was forthcoming. Still, it could not be denied that in some cases these ubiquitous germs could be excluded—if so they did not hatch out of themselves in the broth. But the opponents of spontaneous generation refused to be convinced. They pleaded that germs must have oxygen to live just as we do ourselves; and sealing the flask, said they, if it did not actually exclude oxygen, at all events very markedly limited it. Sixty long years passed before even one more step forwards was taken. In 1836 an experiment was conducted wherein air was continuously passed to the boiled liquid in the flask, but to get there it had to pass through concentrated sulphuric acid, after which it was strongly heated. Then no growth occurred in the *bouillon*. This proved that in Spallanzani's historical experiment it was not want of oxygen that had

prevented the breeding of bacteria. But, urged objectors, in this experiment such chemical change must have taken place in the air as to render it impossible for germs to live in it. This new objection remained unanswered for eighteen years, but at last two ingenious experimenters, Schroder and Von Dusch settled the question for all time. They passed the air to the liquid through a filter of cotton wool. There was no intense heat to calcine the air—no chemical to spoil its nature. It was evident that there was a something in the air which cotton wool could mechanically filter out, which caused putrefaction, and that without this something no life appeared. This finally crushed the spontaneous generation theory. At the same time it established a new fact that all putrefaction was due to germs floating everywhere in the air. In the course of this long struggle the experimenters had hit upon many stray facts useful to this day—for instance, to this hour we plug flasks and test tubes with cotton-wool to exclude germs. Indeed, Spallanzani's original experiment with the sealed flask was the direct ancestor of the art of tinning foods, which in its day, before the cold storage process had been invented, did so much for American prosperity. We now come to the discoveries of Pasteur. He carried the cotton-wool proof a step further, for by heating the neck of the flask, drawing it out fine and bending it over he succeeded in dispensing with even the cotton-wool filter. It was he who first advanced the theory of spores, and thus explained the occasional failures of Spallanzani. His notion was that the temperature of boiling point was fatal to germs but not to spores. With the idea of proving his theory he boiled his *bouillon* and stood it on one side. In a day or two, when he thought the spores had had time to develop into bacilli he boiled the liquid again. Even twice boiling did not always absolutely sterilise his broth. Some spores were evidently more backward in developing than others. A third boiling proved quite effectual. At the present time there are observers who assert that though the process was successful the theory was wrong, and that

the real explanation is that alternate boiling and cooling is more injurious to bacteria and their spores than keeping at the boiling point continuously for even an hour. For my part this theory that some of the seeds of bacteria germinate later than others seems exactly analogous to what happens among the visible plants and trees. It is a well-known fact that when a bush fire sweeps through a forest trees spring up of a different kind to those that were destroyed. The idea is that the ground is full of seeds that keep their vitality for very many years, but never have a chance to germinate. The fire roasts the seeds to a depth of three or four inches, and then those below are free to spring up at the invitation of the first shower. I remember once seeing a wheat field on a hill so thickly grown with poppies that it looked like a scarlet blaze a long way off. I was told that for many years this meadow had been used as pasture land, but that when long before it had been a wheatfield it had been remarkable for its growth of poppies. It seemed evident that the poppy seeds had lain dormant all the while to come to life again as soon as the field was ploughed. When a putrescible liquid is rendered absolutely free from germs it is spoken of as *sterile*. Supposing a germ can double itself in an hour—and many can do it in much less—then we have a simple arithmetical task to find out how many there will be in 24 hours. It is the old joke of the horse shoes to be paid for at one farthing the first nail and double as much for the next one, and so on through the series. In this way the unfortunate owner had to pay £34 for having his horse shod. The chart on the wall shows that if you left a single germ in your *bouillon*, the next day you would have nearly 17 million of them. Of course as they multiplied food would become scarcer, and their rate of increase would gradually dwindle. In my third lecture, however, I shall give you an actual example, of which I now show the chart, in which they were counted from hour to hour, when 3,000 germs per c.c. (twenty drops) reached in 24 hours, under favourable circumstances, 577,000,000. The fact that spores can

resist boiling heat is perhaps not so remarkable as that the very germs which succumb to that heat can withstand any degree of cold that can be applied. When the Fahrenheit thermometer, which we English still use in our intense conservatism, was invented, it was supposed that zero represented absolute cold—that is, —32 deg. or 32 deg. below freezing. Now we are practically certain that —273 deg. is the point which represents no heat at all. Professor Dewar has, within the last few years, succeeded in liquifying all the gases except one called Helion. Each gas when liquified has enabled the experimenter to secure a greater degree of cold and so liquify another. Liquid air you have all heard of—we live in hopes of utilising it as a motive power. Its temperature is only —168 deg., but the professor has got down to —260 deg. to —263 deg. In his presidential address to the British Association at Belfast last September, Professor James Dewar thus described his experience with germs under this intense cold :—“These (typical) germs were exposed to the temperature of liquid air for 20 hours, but their vitality was not affected. The same result was obtained when liquid hydrogen (—252 deg.) was substituted for air. A similar persistence of life in *seeds* has been demonstrated even at the lowest temperatures; they were frozen in liquid air for over 100 hours with no other result than to affect their protoplasm with a certain inertness. Subsequently commercial samples of barley, pea, vegetable marrow, and mustard seeds were literally steeped for six hours in liquid hydrogen, yet when sown by Sir Thiselton Dyer at Kew the proportion in which germination occurred was no less than in other batches of the same seed which had suffered no abnormal treatment.” After this we may well ask, What is life? Certainly not chemical action, for all such ceases at these low temperatures. Bacteria are as indifferent to pressure as to cold. Dr. Krause submitted typhoid, anthrax, and tubercle bacilli to a pressure of 500 atmospheres, or 7,500 lbs. to the square inch, and they emerged with virulence unimpaired. Nor does prolonged drying through a long summer make

them die of thirst. They are a hardy folk.

The progress that bacteriology made under Pasteur's fostering genius was amazing. The story of some of his discoveries reads like a romance. The silkworm industry of France was threatened with destruction owing to the devastating ravages of a disease called *Pebrine*. Pasteur studied the matter carefully, and came to the conclusion that the very eggs contained the germ of the ailment. He kept moths separate from one another; as soon as the egg laying was finished he crushed the body of the moth and examined a drop of the juice under a microscope. Whenever he discovered the germ in the mother he found that later on the worms that hatched out from its eggs became infected with the disease. Practical results quickly followed. Girls were established at each factory with microscopes. Every moth was kept separate and carefully examined. Only the eggs of healthy mothers were kept, and the rest were burned.

So much for the history of the microscopical work, but that alone was insufficient. The problem was how to separate the various species, crowded together as they were in such millions, and study them apart? It was Koch, the famous German savant who accomplished this part of the work. I have already pointed out to you that mathematics teaches us that one tiny drop of fluid might contain between five and six hundred millions of germs. It was hardly likely that such incredible numbers should all be of one species, but how were they to be subdivided by five hundred million? This was the method Koch adopted, which stands to-day as the approved plan. Different germs flourish best, or only in some special culture medium—the one most used is meat broth, or peptone. Gelatine is a material which can be combined with the nutrient medium, and is added because it can be rendered liquid by gentle heat, such as is injurious to very few germs, and yet is solid at the ordinary temperature of a room. Gelatines slightly vary in their melting points, according to their source. It would make you shudder were I to tell

you all the sources from which the gelatine of the shops is derived, but I will spare your feelings. Calves' feet jelly is regarded by us as a delicacy; it is just gelatine, but so is the birds' nest soup of the Chinaman and the Frenchman's frog. A certain Japanese seaweed known as agar-agar gave a particularly suitable form of gelatine, which did not melt too readily, and was largely used in these experiments. Having prepared his "nutrient agar-agar" as the combination of bouillon and gelatine was called, Koch warmed some, and as soon as it was melted, poured it into two or three test tubes. Every precaution was taken to be sure it was sterile to begin with. Then some germs were added to one of the tubes by dipping a fine platinum needle in a suspected liquid, or lightly scraping a suspected solid with a sterilised platinum loop. However gingerly the operation was performed there were sure to be thousands and possibly millions of germs transferred to the test-tube. These were well stirred in, and then a drop from the first tube was inserted into a second and stirred up. A drop from that was used to inoculate a third tube. In this way the original germs have been diluted, say, to one-thousandth of one-thousandth of one-thousandth of their original number. The material from the third tube is poured on to a glass plate, and put to develop in a special chamber.

Probably there would not be more than five or six germs on the plate. Each feeds on the nutrient material and rapidly multiplies, so that colonies form, each derived from a single parent and therefore all of the same species. Koch was soon able to lay down certain conditions that must be fulfilled before any experiments could claim to have identified a germ. After finding a germ associated with a particular disease (for instance), it must be isolated in the way I have described. When a pure culture has been obtained, any animal inoculated with that germ in such a way as to exclude all other bacteria, must show the original symptoms, and the germs must be once more isolated from its tissues. As far back as 1849 the germs of anthrax were detected in the blood, but it was then impossible

to separate them or to prove that they were the sole cause of the disease. This shows the vital importance of the process Koch devised, simple as it seems. It is only 23 years ago that he discovered the germ of typhoid fever, the first of a

series, the last of which, the discovery of the germ of bubonic plague, was made only nine years ago. This was the work of Kitasato, a great Japanese investigator. Europeans will have to look to their laurels.

(To be Continued.)

Paspalum Seed.

FURTHER examinations, says Mr. C. T. Musson in the *Agricultural Gazette* of N.S.W., have been made of seeds of *Paspalum dilatatum*, chiefly for the purpose of formulating some easily-managed method of detecting good seed from bad—in other words, how may a planter get at the actual value of a sample of seed without having to go to much trouble, or requiring any special apparatus?

Doubtless no perfectly accurate method is likely to be found. It is easy to get at weights, for instance, in hard smooth seeds, such as wheat, linseed, buckwheat, and clover; but it is not by any means so easy to get always the same conditions in weighing various lots of hairy or soft seeds, such as those of *paspalum*; therefore, any results are liable to deviate somewhat. A fair average can be struck, however, and, as will be seen below, anyone can obtain results quite sufficiently accurate for all practical purposes.

HOW TO JUDGE THE SEED.

1. *Appearance to the eye.*—Take 200 seeds, counted out from the bulk, all kinds as they come, without selecting apparently good seed; spread out on glass, and hold so that a bright light is behind them. The presence of good seeds is readily distinguished from their dark colour. These can be picked out, and the percentage easily calculated. When in doubt, dissect the fruit by means of small-bladed knife and a needle let into the handle made of a willow twig (or a ladies' hat-pin).

2. *Testing for germinating capabilities.*—So far, our experience here shows a difficulty in obtaining satisfactory tests.

Conditions are not the same inside as in the field, and this seed needs continuous moist favourable weather, or it may lie a considerable time dormant. The best method so far known here is to scatter over a box of damp sand and press the seed in with a board, then cover with a light sprinkling of soil. The box should be kept protected from drying winds by means of a sheet of glass, and, of course, should be regularly watered. Of the seed tested here, that from the northern rivers is by far the best, seed grown elsewhere giving a very poor percentage of "formed seed."

3. *Weight of seed.*—The following table may be useful as a guide, for the weight test is quite reliable in giving roughly the character of the seed under examination. The figures were arrived at after careful weighings and countings of numerous samples, a balance being used which turns with one *paspalum* seed (there are about fifty in a grain). Difficulty is experienced in the packing when bulk is tested, consequently some deviation may be expected. It will be seen that the bushel weights vary very much. By running seed into receiver, without shaking, weight in No. 1 was 8 lb.; on shaking to settle it down, the weight was 10 lb.; another weighing, after packing seed by shaking and bumping, gave 12 lb. Provisionally, this scheme is put forward as the handiest method of detecting bad from good seed, for good seed is much heavier than poor, as the weight increases with the number of kernels formed. The quantity in samples was not sufficient to enable full particulars as to weights being given.

Four Samples of different value in respect of good "formed" Seed contained therein.

Class.	No. 1. Poor.	No. 2. Medium.	No. 3. Good.	No. 4. Very Good.
Percentage of seed formed	6	43	56	83
No. of "formed" seeds in 1 lb., about ...	29,400	161,035	217,560	223,155
May be expected to germinate of the seeds in each lb.	23,520	128,828	174,048	178,524
1 pint weighs about	3 oz.	*...	*...	6 oz.
1 pint contains of formed seed, about ...	5,944	*...	*...	90,665
1 bushel (by computation) would weigh about	12 lbs.	...	...	24 lbs.
1 bushel weighs by chondrometer according to packing	8 to 12 lbs.	...	...	18 to 24 lbs.
Allowing 3 seeds to each square foot in an acre (1 plant would be sufficient) when well grown would take about†	4½ lbs.	14 oz	10 oz.	9 oz.

* Insufficient quantity of seed to furnish details.

† It would be impossible to spread evenly such small quantities as 9 or 10 oz., and the young plants would be better for being close together as they would get more shelter, especially in trying weather.

It will be observed that whilst 1 lb. of No. 1 contains a fair number of "formed seeds," No. 4 is worth eight times as much in this respect, or one-eighth of a pound of No. 4 would go as far as 1 lb. of No. 1. Fair seed should weigh 16 to 20 lb. a bushel.

It has been frequently remarked by growers, whose seed as harvested shows less than 10 per cent. seed with kernels ("formed seed"), that they "always find seedlings in plenty round about the parent plants," or that "such seed when sown gives good results." Seeing that with only 4 per cent. of "formed seed" there are about 16,700 in 1 lb., there would, even in this poor seed, be plenty to furnish a good supply of young plants, for we have good reason to believe that where kernels are formed they are mostly fertile.

Respecting the relative merits of cheap and dear seed, let us suppose a case:—10 lb. weight of cheap *paspalum* seed, say, at 6d. per lb., costs 5s., with 6 per cent. "formed seed" (94 in every 100 are empty shells only); this would contain 294,000 seeds. 1½ lb. of very good seed, such as No. 4, at 1s. 6d. per lb., costs, say, 2s., testing 80 per cent. of "formed seeds"; this would contain 329,550 seeds. Were a heavy quantity of seed required this matter would assume considerable importance.

HARVESTING.

One prominent and successful grower of really good seed writes us, *re* harvest-

ing, as follows:—"All my seed is hand-shaken. I do not adopt the usual custom of cutting, leaving out in the paddock for three or four days, then collecting and threshing, because by the time it gets to the threshing cloths the very best of the matured seed has dropped out, and this is the reason that the great bulk of the seed on the market is so inferior.

"The plan I adopt is immediately it is cut it is carefully placed on cloths, taken up to the barn, and well shaken for a couple of days. This is my first-class, standard seed. A lot shakes out after this for several days, but its quality is second-rate, and it only sells as such, giving medium results only providing there is continuous moisture in the ground, with rain for about three weeks; but under favourable conditions it nearly all perishes, whereas the fully-matured seed will stand adverse conditions and come up after many months in the ground."

It should be noted that seed harvested by rubbing out or threshing in the ordinary way is poor, as there will be in it a very large proportion of empty seed-cases.

GUARANTEED SEED.

Some sellers guarantee their seed. In this case probably the guarantee refers to what is called herein "formed seed," the balance being empty shells. So far as can be at present judged, about 60 to 80 per cent. of the "formed seed" germin-

ates. This would mean that in the case of the four samples three-fifths to four-fifths of the good seeds in each pound, as shown in the table, should germinate. Buyers should get any guarantee clearly defined, as a sample like No. 4, the best

herein mentioned, could only possibly germinate 80 per cent., and the percentage to be expected would only be 64, as in every 100 seeds only 80 have kernels, and of those that have kernels only 80 in every 100 germinate.

Boone County Maize.

ENQUIRIES having been made with regard to the characteristics of the Boone County white maize recently imported by the Department of Agriculture, the following extract from the "Book of Corn" may be of public interest. Although the Boone County white is described in this extract as being from medium to late maturity, its period of ripening is said to be from 110 to 120 days. In this country, therefore, this mealie would be regarded as an early ripening kind.

History.—The Boone County white corn was originated by Mr. James Riley, of Boone County, Indiana. Mr. Riley began selection from a large coarse variety of corn grown in Boone County, commonly known as the White Mastodon, in 1876. This White Mastodon seed secured by Mr. Riley was planted on a separate field from other varieties, and has never been crossed, being changed in type by selection. Mr. Riley attempted to remove the barren stalks by cutting out such stalks before they produced pollen. After several years of selection, he gave his new type of corn a new name, Boone County White.

Seed of the Boone County White was early secured by Mr. O. C. Block, of Champaign County, Illinois, and by careful selection for about ten years the characteristics of shape of ear, kernel and cob, and the indentation of the kernel, have been changed. The proportion of circumference to length has been increased by Mr. Block. The indentation of kernel in the Block type is deeper than the Riley type, but the shape of kernel has not been greatly changed. No doubt that by continued selection along the lines already laid down by Mr. Block and other growers of the Boone County White, a distinct type can be produced.

The Boone County White is of medium to late maturity, ripening in 110 to 120 days, adapted to central and southern sections of Illinois. It has been bred for large ears, and consequently matures slowly. There is a tendency to the production of a poorly-filled tip on account of the length of ear, which must be overcome by careful selection.

Characteristics.—1, ear slowly tapering; 2, circumference 7.5 inches, length 9.3 inches; 3, kernels firm on cob and upright; 4, number of rows 16 to 22; 5, space between rows medium to wide; 6, kernels in distinct pairs of rows, developing distinct rows at tip; 7, butt moderately rounded, slightly compressed, enlarged or expanded; 8, kernels white, broad, even at summit, with slightly curved edges and creased to rough projection indentation; 9, shank medium; 10, cob medium to large, white.

Four trained Spanish oxen were among the attractions at Olympia, West Kensington, in the winter of 1887-8. They were big powerful beasts, but their docility, and the readiness with which they went through their tricks, was wonderful. They waltzed to the strains of the band, stopped dancing when the music ceased, and marched singly and in pairs in various styles, the pairs always keeping step. One of the bullocks climbed a small ladder and stood on the top while his companions arranged themselves below. Two of them played "see-saw" and appeared to thoroughly enjoy it; the intelligence of one bullock was particularly manifest on the see-saw, as he was a good deal lighter than his companion and had to move his feet and swing to and fro to raise him. The final performance was on the low wall which separated the arena from the audience. One bullock walked on this wall, another followed him closely with his forefeet on the wall and his hind legs in the arena, and a third made the circuit of the arena with its hind feet on the wall and its forelegs on the ground; the three kept well together in their journey round.

Indigo Seed.

THE following letter from the Berar Indigo Planters' Association, Ltd., Mozufferpore, Kirhoot State Railway, India, is published for general information. Much information on this subject will be found in Volumes IV. and V.

Dated 18th September, 1903.

The Director of Agriculture,
Pietermaritzburg.

SIR,—I have received through the Government of Bengal copy of a letter from you dated July 20, also copy of a communication from Colonel Friend Addison to the *Natal Agricultural Journal*. I note you will arrange for 1 ton of Indigo seed in March (or) April, 1904.

Correspondence through Government necessarily takes some time, and I have the honour to suggest that, if you will be good enough to correspond with me direct on the subject, this delay will be obviated.

There is at present a good demand for Natal seed, but entire ignorance as to probable cost.

A Mr. Bayley was in South Africa last year, making enquiries about seed, and he sent over a little, but the cost was prohibitive.

I presume the seed you will send will be from the wild plant; but if arrangements could be made with, say, half a dozen farmers to cultivate the plant for seed only, I am sure that on our side a

satisfactory financial settlement could be arrived at.

The difficulty experienced with Natal and Java seed (which came from Natal stock), is the very hard husk, which prevents the seed from germinating at the usual time, i.e., in February and March in natural moisture. It will germinate freely at the commencement of the rains, but at that time the weeds grow faster and choke the young plant. It is impossible to keep down the weeds in any large area. Again, in September the seed will germinate, but it must have a good rain on it; this often we do not get, and the season would be lost. I notice Colonel Addison does not allude to this difficulty, and I should feel very much obliged for any advice on the subject. I understand clover seed at home is bruised between tin plates with sand for the purpose of breaking the husk to a certain extent, or the seed might be soaked, and then sown broadcast.

The points I have the honour to ask you to settle as far as possible now are :—

1. What would be the approximate cost of growing Indigo per ton of seed delivered, say, at Durban?

2. The cost of collecting wild seed, and what quantity would be available?

Apologising for troubling you at such length,

I have, etc.

E. MACNAGHTEN,

General Secretary.

Butter Samples.

SAMPLES of butter received from "Ignoramus" which I have scored as follows :—Flavour, 25; colour, 5; grain and texture, 18; dryness, 7; style and neatness, 9. Total 64.

This sample of butter could not be characterised as a first class one, as the flavour of same was entirely wrong, and there was far too much moisture left in the butter. However, if I were "Ignoramus," I should not be in any way dis-

couraged, but should try again before sending in another sample for examination. I shall be glad to receive answers to the following questions :—Is a butter-worker being used? Is the butter washed in the grain or churned into a lump? Does "Ignoramus" use a separator or hand-skim the milk, as the sample of butter sent had the appearance of being made from set cream?

If "Ignoramus" will answer the above questions, I shall be very pleased to give further advice.

ED. O. CHALLIS,
Dairy Expert.

Sample of butter received from "Amateur." This sample reached my office in excellent condition. The following is the number of points awarded:—Flavour, 44; colour, 5; grain and texture, 24; dryness, 10; style and neatness, 8. Total 91.

I must compliment "Amateur" on turning out such a well made pound of butter, and the only fault I have found with it is in the flavour, which was not quite correct, the cream evidently having been slightly tainted when churned. This taint, which showed itself in the flavour of the butter, is very common out here, especially during the hot summer months. The exact cause of it is very difficult to say, as there are so many reasons which might be indirectly causing the trouble. The following are the most likely:—Mixing warm cream with cold; neglecting to stir the cream several times a day; leaving too much milk in the cream through faulty separation; keeping cream in an impure atmosphere; not cooling cream down as quickly as possible after separation; and last, but by no means least, not keeping milk and cream buckets scrupulously clean. Some of the above reasons may be the cause of "Amateur's" butter not being quite correct in flavour, but if a little attention is given to the details I have enumerated, I am sure improvement in the matter of flavour will be the result. I also noticed that "Amateur" used butter muslin instead of butter-paper for wrapping the butter in. There is no harm, of course, in using clean butter muslin, but it affords no protection to the butter. Any dirt or dust can get through the muslin on to the butter. Some few years ago a good many merchants objected to the use of butter-paper, but scarcely any do so now, so I think "Amateur" would find that by using butter, or, as it is often called, grease-proof paper, that the butter would

be better protected during transit to market, as well as being much cheaper than muslin. In advising the use of butter-paper, I only mean butter-paper of the very best quality, and not some of the cheap and nasty kind which is so often supplied to the farmers in this Colony.

Sample of butter received from "Flaxton." I have awarded it the following points:—Flavour, 48; colour, 5; grain and texture, 24; dryness, 10; style and neatness, 9. Total 96.

This sample of butter arrived in splendid condition, and no criticism on its quality is necessary, as the above points awarded will indicate. The flavour was full and rich, and the butter when cut showed a clean and "waxy" texture, which is always an indication of being well made and of good keeping qualities.

Sample of butter received from "Penmount." This sample is scored as follows:—Flavour, 46; colour, 4; grain and texture, 19; dryness, 8; style and neatness, 8. Total 85.

As this sample comes from a farm very adjacent to "Flaxton's," I have been asked to give an opinion on the relative merits between the two samples. A perusal of the points awarded to the samples in question will give a fair indication of the difference between "Flaxton's" and "Penmount's" butters. The flavour of "Penmount's" butter was not so clean or pronounced as "Flaxton's," nor was the colour quite so good. Where "Penmount's" butter failed chiefly was in the grain and texture and freedom from moisture, or, as it is headed, dryness.

There are many things which affect the texture of butter, as it is a well known fact that different creams from different cattle, which are also fed differently, require quite a different treatment, and I know from experience that if I churned cream from such breeds as the Channel Islands, Zulu or Afrikander at a fairly high temperature, I could generally produce butter of fair texture, but if I were handling cream produced entirely from the Shorthorn breed and I churned it at

the same temperature as the first named breeds, I should not be able to produce a butter with anything like as good a texture, unless I made a considerable difference in the temperature I churned at.

All this points to the fact that different creams require different treatment, and no doubt if "Penmoun's" butter is to reach the same standard of excellence

as "Flaxton's," the treatment of the cream would have to be varied. This variation of treatment on a farm is very easy to advise, but quite another matter to carry out, as it would necessitate the ripening and churning of one cream at a much lower temperature than the other; and this reduction of temperature can only be brought about by artificial means.

Correspondence.

To the Editor *Agricultural Journal*.

COMMON SENSE AND KINDNESS.

DEAR SIR,—Farmers and stock-breeders may learn a good deal from the article appearing in the *Journal* of 13th November, entitled "A Great Poultry Farm." It calls to mind what Autolyceus sings:—

"A merry heart goes all the day,

Your sad one tires in a mile-a"

The longer we live the more we see how impatience and rashness, instead of helping, defeat the end we are seeking to attain.

It must be confessed that amongst Blacks, Boers and British in South Africa, not to go out of the country for examples, we find animals and poultry treated unkindly and even cruelly. I have reared poultry for years, and always found that the "chick chick" method mentioned in the above article is far better than knocking the fowls about, compelling hens to sit in places *not* selected by themselves, turning the incubator chicks out at three or four weeks old to fend for themselves; and all such similar semi-cruel practices, thus warring against nature and animal instinct. The process of horse-breaking in these Colonies is often cruel in the extreme. Kind and firm treatment will ensure to the owner a life-long valuable servant, unless the horse is incurably vicious. Many men never seem to consider that the horse is a most intelligent animal. Some horses seem positively capable of exercising a reasoning faculty. About 15 months ago Mr. Dan Scott was watering his traction engine in a narrow part of the Zwartkop Valley Road. I

was riding a young mare, and she was naturally frightened at the monster. Mr. Scott spoke *kindly* to the mare, allowed her to *smell* what a human being was like, and she allowed him to lead her gently and quietly past the mass of iron and coal that was blocking for the moment a narrow pass in the road. Again, the way in which cattle owners allow kafirs to bang about oxen, cows, and young stock is very detrimental to success in cattle farming. In most cases this cruelty cannot come within the reach of the S.P.C.A., but to take the lowest view of the matter the farmer is the loser thereby. Referring again to the "Great Poultry Farm" in Ohio, U.S.A., page 781, and ignoring for the time being the "advice" so profusely given in numerous papers and journals by fancy poultry farmers, I trust your readers will pardon me if I endorse the article which has called forth these remarks, and express the hope that they treat their live stock not only with kindness but with common sense.

Yours faithfully,

W. LISTER.

Lidgetton, Nov. 28th, 1903.

A COMPLAINT.

SIR,—In the *Journal* received to-day I see I am still under license for scab. This is not correct: my license should have expired on the 4th inst., but the Inspector did not come until the 10th, when he pronounced the flock clean.

I see also that three black sheep and a

lamb are advertised as running here. This is also wrong. There are no such sheep here, and I did not authorise the poundmaster to advertise any sheep.

Trusting you will kindly publish this as I have been put to sufficient loss through neighbours giving my sheep the scab without having my flock kept under licence longer than necessary, thereby losing two opportunities of selling some at stock fairs, or having the responsibility of these three sheep and a lamb thrown

on to me besides.—Yours, etc., E. SYMONS.

Glenbella, Nov. 19th, 1903.

(The District Veterinary Surgeon, Mooi River, reports that the Stock Inspector informs him that owing to duty elsewhere, it was not possible for him to inspect the sheep on the expiry of the licence—the 4th ulto. On the 10th the flock was found clean, and the licence was raised. The *Government Gazette* was our authority for the pound notice.—Editor, *Agricultural Journal*.)

Indian Camels for Trial in Rhodesia.

AUTHORISATION having been received, the following dispatch is published for general information:—

Resident Commissioner's Office,
Salisbury, 9th Oct., 1903.

High Commissioner.
No. 137.

Sir,—With reference to your despatch No. 4,194/03, dated 30th September, 1903, covering a copy of a report by the Secretary to the Department of Agriculture, Salisbury, with regard to camels purchased in India for trial in Rhodesia, I have the honour to report for the information of the High Commissioner that as soon as seemed expedient after their arrival, five months ago, the camels, both riding and baggage, were put to light work which has gradually been increased, and they are now in good condition for hard work, with the exception of the cows that are in calf.

With regard to the riding camels, Colonel Flint has just returned from an inspection of a proposed post route from the Ayrshire Mine, the terminus of a railway 75 miles distant from Salisbury, to a point on the Zambesi opposite Feira, a station in North Eastern Rhodesia, whence there is a postal service to Fort Jameson.

Colonel Flint left Salisbury three weeks ago with one of the B.S.A. Police, five Sikhs and two Mashonaland natives all mounted on camels. Exclusive of the saddles, which weigh approximately 40

lbs., each camel carries on an average 280 lbs. The total distance traversed was about 400 miles. The camels had four days' rest at different places on the journey, and the last day did over sixty miles.

The greater part of the way was by kafir paths, part of which is described as difficult for horses, and for a considerable distance in the descent to and in the valley of the Zambesi a way had to be cut through dense bush.

There was no casualty, and the camels have returned in good order and condition. While travelling the last 100 miles to the Zambesi, and for the same distance on the return, the camels had no grain, and were dependent for food on herbage and foliage.

Colonel Flint informs me that the rate at which he travelled was about five miles an hour, and from this and other experience he is satisfied that riding camels, such as are in his charge, with good riders can easily carry 350 lbs. thirty miles a day, and keep this up for a month, provided the camels get a day's rest in the week. The grain ration is 10 to 12 lbs. a day.

The baggage camels have been employed in carrying and drawing produce from farms. The males will each carry a load of from five to six hundred pounds, according to the size of the animal, 25 to 30 miles a day. The females 450 to 500 lbs. a similar distance; the rate of travelling being three miles an hour.

Camels have also been trained to draught. The ordinary ox or mule waggon has been employed, and a team of eight camels have been proved to draw loads of eight to ten thousand pounds, dependent on the character of the roads. In the draught the pole is supported from the baggage saddles of the wheelers; the pole has a bugle to which is fastened a strong swingle for the attachment of traces for the pair of camels in front of the wheelers; the remainder have the ordinary hook in harness similar to that used by artillery.

The camel has proved useless for single draught unless the roads are exceptionally good.

On the whole so far the experiment has proved a success, and I am informed that the Administration intends to repeat it; it has been particularly fortunate in its selection of Colonel Flint, a gentleman whose Indian connection and experience

specially qualifies him to purchase the animals, and to experiment in the best modes of utilising them in this territory.

It still remains to be seen how the rains will affect the health of the camels, and whether they can be employed for draught or baggage purposes on slippery roads or through swamps and rivers.

There are and have been for some time natives of the territory undergoing instruction in camel management, and Colonel Flint expresses himself well satisfied with the way they shape, and hopes ultimately to dispense with the services of the Sikh drivers he brought with him from India and substitute for them Mashona or other South African natives.

I have, etc.,

M. CLARKE,

Resident Commissioner,

The Acting Imperial Secretary,

Johannesburg.

Motors on the Farm.

THE only kind of farming, says the *Daily Telegraph*, that is now practicable in the United Kingdom is that which is strictly governed by the two maxims—efficiency and economy. Under the former is comprehended the readiness to take full advantage of the suitability of the land to produce certain articles of the best quality that are in demand, and that are less liable than others to be elbowed out of the markets by imported goods; while the latter implies a determination to use every means that can lessen the cost of production.

The efforts of the agricultural mechanician have long been devoted to the perfection of machinery for helping the farmer to secure his own crops rapidly and economically. The development of the self-binding harvester is indeed one of the triumphs of agricultural engineering that deserves to be described as epoch-making, and worthy to take rank with the most celebrated achievements in the application of science to other arts and industries. There is, however, no standing still, and the opening years of the

century have witnessed the introduction of a power that may effect as great a revolution as has already been accomplished by the general employment of reapers and binders.

Although the motor has not very long been in actual use as a power for road traffic, its advantages have already to a certain extent been utilised for agriculture. The degree to which this new power has been invoked in the service of the farmer has been imperfectly realised until the appearance, in June last, at the Royal Agricultural Society's Show, of some half-dozen different motors adapted for agricultural use. The motor had already been tried and proved for ploughing and other farmwork. The next test was in harvesting, and much useful experimental work has been carried out in this direction during the season. Experience has been acquired that will doubtless prove very useful, and, at any rate, the motor in the harvest field is an accomplished fact. The difficulties of the year have by no means been in its favour, for the rain-sodden fields have put

all machines to a severe trial. The laid and twisted crops could not in some cases be dealt with by the horse-drawn reaper, and, apart from that, the damp and yielding condition of the ground for weeks made it difficult to have the corn cut by machine. It has certainly been a strange sight to witness corn being cut alternately by the scythe (one of the oldest of methods) and by the motor-drawn reaper (the newest system), and that too on the same ground.

The work of the motor on the harvest field, as has been said, has been mainly experimental, but most instructive and useful for guidance all the same. In a wet year like this the rapidity with which the harvesting has been accomplished by the motor-drawn reaper has indicated the possibility of a decided advantage by enabling the chance to be taken of working at full pressure in the few dry weeks on days that have intervened between the pitiless rain-storms. The difference of having the corn cut rapidly very often means that between profit and loss, for a dry sample of corn, as has already been seen this season, may command 4s. to 10s. per quarter more than will be paid for that which has been damaged by rain. Quick harvesting is therefore of the highest value; moreover, a few days saved in reaping cause a marked reduction in the labour bill, also a great consideration in these times of low prices.

Some notes follow on the work done, by motors this season on the farm, and chiefly on the harvest field, the first portion of these being chiefly summarised from published statements. Wheat covering 19 acres was cut in 10 hours, the petrol consumed being only 18½ gallons. Demonstrations in ploughing gave the following results:—2a. 15p. of land, with a very hard surface, ploughed with double-furrow plough, 5hr. 49min., 7½ gallons of petrol and 2½ pints of lubricating oil being consumed, at a cost (including 2s. 6d. for driver's time, and 1s. 6d. for ploughman) of 15s. 4d., or 7s. 8d. per acre. Six acres of grass were cut in 3h. 40min.; the amount of petrol consumed was 5½ gallons and 1 pint of lubricating oil was used—5½ gallons of petrol at 1s. 4d. per gallon equals 7s. 4d.;

lubricating oil 4d., driver's time 1s. 9d., man's time 1s., equals 10s. 5d. for six acres, or 1s. 9d. per acre. Three acres of grass cut in 1h. 33min., the amount of petrol being 3 gallons; cost, 3 gallons of petrol, at 4s. 4d., 4s.; lubricating oil, 2d.; driver's time, 1s.; man's time, 6d.; equals 5s. 8d. for three acres, or 1s. 11d. per acre. In reaping corn crops and mowing grass the work was accomplished, it is reported, at a speed that could not be approached by horse-power. Pulling an ordinary reaper and binder, the motor cut 19 acres of wheat in ten hours' actual cutting at a cost (exclusive of what might be allowed for wear and tear) of about 2s. per acre. These particulars mainly refer to the "Ivel" agricultural motor.

In England and Scotland successful trials of a motor binder have been made, during the season. The machine has a cutting capacity of 6 feet, and in one of the English trials had a crop to deal with that was laid nearly flat, but it cut almost close to the ground. In one of the trials in Scotland the crop operated on was oats with a thick underbottom, which made sheaving difficult; yet everything was done to the satisfaction of those present. Some useful information as to this machine is available. It is the Walter A. Wood Motor Binder. The cost of petrol, purchased at the most convenient place locally, that has been used for this motor binder, taking the average, from experience in Aberdeenshire and Wigtownshire in Scotland, and Essex and Kent in England, for six-horse-power motor, has been 5½d. per acre, with a machine cutting 6 feet wide; and all the corn crops cut, with one exception, were heavy—some of them badly laid and tangled, and on soft ground. In connection with this machine, it may be mentioned that a horse has been used for steering. This need not be taken into consideration when estimating the cost, as the power is sufficient to work and propel the machine, and a machine made to be steered mechanically will not increase the consumption to any appreciable extent, although a 10-h.p. or 12-h.p. motor and a wider cut of machine are advisable, for with a slightly-increased cost of machine and petrol the proportionate

expense per acre will be decreased. A competent authority remarks that one of the greatest advantages of this machine to the farmer is that the binder does not have to depend upon traction for power to do the work; it can be operated immediately after rain, as soon as the corn has dried, without having to wait for the ground to harden; therefore harvesting can be carried on with much less loss of time. "There is no question," he adds, "in his mind about the practicability of the machine in a country like England, where horses are so expensive, and where the weather is often so treacherous in harvest-time." One of these motors, in use at periods in different parts of the United Kingdom for over a year, has never given five minutes' trouble: complications are avoided, and it is remarked that really there is no more difficulty in the way of operating motor binders than there was in operating the first self-binders. With the attachment of the motor direct to the binder the cost of the former is cheapened over the traction-engine principle, and the motor can be used for other farm work as desired. Another advantage claimed is that the knife moves always at good speed, the same when turning corners as going ahead, thus ensuring good, clean cutting.

With reference to one of the machines exhibited at Park Royal (the Scott Motor Cultivator), the inventor was not ready to put his reaper and binder attachment for motor vehicles on the market this year. His tractor can be, and has been, used for hauling the usual horse imple-

ments—ploughs, cultivators, harrows, mowers, binders, etc.—but the attachment of these implements means a second man to work them, whereas with his binder attachment, as with his cultivator, etc., only one man will be required to drive both the motor and the implement or implements it is working. It is calculated that the cost of complete cultivation by this motor is 4s. per acre, and by horse power 10s. per acre.

The motors for agriculture entered for the show at Park Royal included the Ivel agricultural motor, Messrs. Walter A. Wood's self-binder, harvester, and motor combined, Mr. John Scott's motor cultivator, etc., Messrs. Ransomes, Sims, and Jefferies' agricultural motor, etc., the Tractor Simplex Balanced Motor Syndicate's agricultural steam motor, and Messrs. Drake and Fletcher's agricultural petrol motor. It may be added that one or two of the motors enumerated above are undergoing further trials before being placed on the market.

Motors that can be used for ploughing, digging, reaping, mowing, driving stationary machinery on the farm, and hauling loads, will prove a great boon to agriculturists. The cost of such machines must necessarily be considerable, and for their full utilisation co-operation on the part of the farmers in a locality may at first be desirable. The prospects of the ultimate extended use of the motor on the farm appear to have been distinctly improved by the experience acquired during the past harvest.

District Reports.

BULWER, 5th December.—During the last fortnight we have had only two days without rain, and the fall has been heavy, so that all the rivers and springs will soon be running strong in this part of the Colony. On Friday last Mr. Claude Fuller, of the Agricultural Department, delivered to a very small attendance of farmers and others at Bulwer a very interesting lecture on various subjects. The representation on maps or charts of the subjects of his discourse enabled his audience to follow him easily right through. It seemed to be an inopportune time of the year to visit country districts for the purpose, as farmers can ill afford to leave their farms just now—all being more or less pressed

for time to get in all their crops. The principal object of the lecture was, I take it, to demonstrate to the farmers the necessity of dipping their stock to protect them from the dreaded African Coast Fever now threatening the Colony. Some very important information was given by Mr. Fuller how to deal with and mitigate the mealie grub and cut worm, also hints in tree pruning and planting, etc., and it is to be regretted there were not more people present to profit from his knowledge and experience. I hear that several more flocks of sheep have broken out with scab, and this among large flock-owners, which is much to be regretted. It has come to my notice that a good many of the sheep-

owners in this Division have not registered their brands as required by law in the Magistrate's office. As there is a heavy penalty connected with the omission, sheep-owners who omit to do so will be liable to be reported, and fined from £2 to £20. Large quantities of wool still continue to pass through Bulwer daily for Pietermaritzburg. All kinds of stock, except sheep, as far as I know, are free from disease, and now in splendid condition. All kinds of crops are looking most promising. Potatoes are not yet equal to the demand, but there will soon be any quantity, also other kinds of vegetables. As regards fruit Marabella plums are now plentiful; blue gages are just ripening. There have been plenty of strawberries this season. The Government have promised to have an inspection of the road, applied for from Bulwer to Cockscomb Ridge; the latter being the nearest point from Bulwer to the Cape-Natal Railway.

H. W. BOAST, Magistrate.

EMPANGENI, 1st December.—Rain fell on eighteen out of the thirty days of the past month. The heaviest falls occurred on the 8th, 12th, 15th, 23rd, 27th, and 28th. On the two latter dates it is thought at least between three and four inches fell. This heavy fall must have been pretty general, judging from the fact that it was reported yesterday that sufficient damage was done to the railway embankment in the vicinity of the Lower Umfolozi Railway Bridge to delay the train an hour or two. What crops were in the ground profited by the unusual rainfall; and, if the weather continues as propitious for the rest of the summer, a fair harvest may yet be looked forward to, provided locusts—which have been much in evidence—do not destroy the younger crop, now being rapidly planted, in January or February next. Locusts were reported laying their eggs in the thorn veld, both north and south of the upper reaches of the Nseleni stream, and lower down and south thereof in Chief Bejana's Location; also along the upper reaches of the Msunduze stream in Chief Sokwetshata's Mtetwa Location.

A. R. R. TURNBULL, Magistrate.

IXOPO, 4th December.—This district has recently been honoured by visits from illustrious persons from the seat of Government, which have been both appreciated and instructive. Mr. Claude Fuller, Government Entomologist, delivered a lecture to the Agricultural Society which was most interesting, and the explanation of the Tick theory causing cattle to die from Redwater was most convincing, and the action of the Government in permitting this officer to come and explain matters was greatly appreciated. The Hon. Minister of Lands and Works, accompanied by the Chief Engineer and Surveyor-General, have visited the district, and I feel sure their

trip to Dronk Vlei must have shown them the urgent necessity for a Magistracy for the Dronk Vlei District, and also the want of a road from Dronk Vlei to Union Bridge. Parliament have voted £2,500 for a Magistracy at St. Faith's, which Magistracy, in my opinion, is unnecessary at present; this sum might advantageously be at once used for the erection of a magisterial building in the Dronk Vlei District. Yesterday a special meeting of the Farmers' Association was held to receive and hear the views of the Hon. Joseph Baynes, C.M.G., M.L.A., and Mr. James Schofield, M.L.A., and the residents were exceedingly gratified at being given this opportunity. The wants of the Division were admittedly small, and yet necessary, being roads to St. Faith's, improvements of the Highflats and Springvale roads, and a road from Dronk Vlei to Union Bridge. The railway was, and always will be, the burning question until it has been constructed, and any disinterested persons visiting the railway stations at Richmond or Port Shepstone, and seeing the quantity of goods piled up there, and no transport to convey the goods to the inland districts would, unless blind to reason, at once become a convert to the absolute necessity of the immediate construction of a railway into and through the Division.

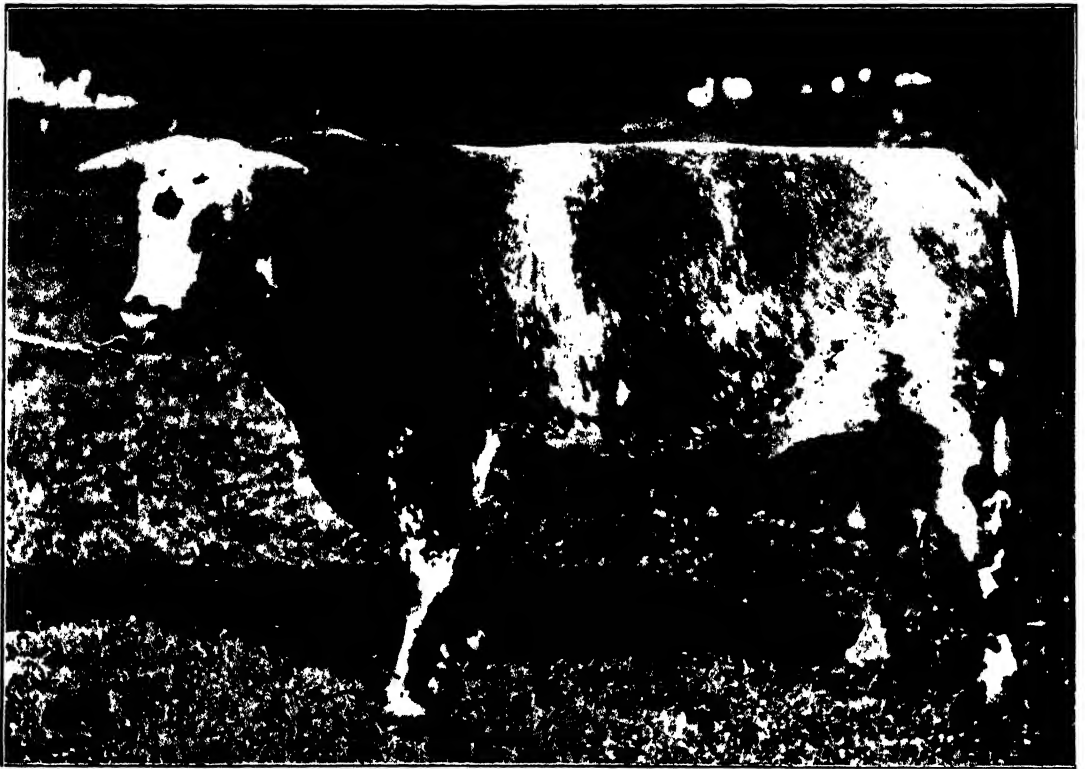
FRANK E. FOXON, Magistrate.

MAHLABATINI, 2nd December.—Rain fell on ten days in the month, and on the 27th we had a regular deluge—5.70 inches falling in twelve hours. The total rainfall for the month was 10.48. Natives complained that they had not sufficient seed mealies, but when the Government offer to send seed, to be sold for cash, was intimated to them, they showed no eagerness to avail themselves of the offer. The fact is that they have found that American mealies germinate all right, and their cry for seed mealies was only raised in the hope that the Government would send mealies on unlimited credit. Several natives were charged with carrying rinderpest meat about, and so spreading the disease, and were severely punished. So far as I know there are only two cases of rinderpest in the district at present. One of the police horses died of horsesickness (Dik-Kop), a few weeks ago, and another was shot for glanders.

A. J. S. MAURITZ, Magistrate.

MAPUMULO, 4th December.—The past month has been conspicuous for the continuous rains that have fallen, as much as 9.16 inches having been registered; the heaviest for one day being 2.75 inches on 29th. The country has greatly benefited, and grass has come on well. Natives are ploughing and cultivating their gardens in real earnest, and should get their crops in in good time, since they have a full month still wherein to sow. The rains have come just in time, and will probably have saved the country from the throes of a serious famine. I regret to report that horsesickness has already made its

SHORTHORN BULL.



FIRST PRIZE, AND CHAMPION, ROYAL SHOW, ENGLAND, 1902.

Exhibited by His Majesty King Edward VII.

By the courtesy of Messrs. Cooper & Nephews



appearance in the Division. Three horses belonging to the Natal Police have died, and one belonging to a resident. However, in the former cases it was undoubtedly due to the horses having been stationed in the thorns, within a stone's throw of the river, for over a fortnight. Patrolling by the Mounted Police in the thorns at this time of the year is a costly business. Cattle and other stock are flourishing and clear from disease.

GUY V. ESSERY, Acting Magistrate.

NKANDHLA, 30th November.—The weather has been pleasant, with frequent thunderstorms and heavy rains, the total rainfall being 9.75 inches, maximum temperature 87 degrees, and the minimum 39 degrees. The scarcity of grain for food is much the same, and cattle, sheep, and goats are being sold at very moderate prices, for either cash or grain. This hardship is felt to a great extent by the natives in consequence of the Natal border being closed to cattle. The heavy rains have washed away a good many fields of young maize, but planting is going on with renewed vigour, and it is sincerely to be hoped that favourable weather will continue. Several large swarms of locusts are hovering about the Division, and in places damage has been done, which is most disheartening to the people. No laying of eggs

in this part has as yet been reported. There were eight deaths from rinderpest during the early part of the month, but I am pleased to report that at the present time there are no cases of this disease existing; consequently unless some further outbreaks occur the Division will be clear from all cattle diseases. I cannot speak too highly of the indefatigable manner in which Mr. T. W. Cooper, Government Inoculator, has carried out his duties, and the early disappearance of rinderpest here is entirely due to his labours, which at times were very uphill work, as in places it was hard to get the natives to see the advantages of inoculation. Three head of cattle and two goats died from the effects of some vegetable poison in the ward of the Chief Mpmela. No deaths from horsesickness have been reported, but mange is still bad in places. One wild dog was killed in the ward of the Chief Sit-shili, and the reward was paid. The health of the Division on the whole has been good. The Chief Mpmela this day (30th instant), reported a case of suspected small-pox at the kraal of Ndhlanvu. The district surgeon has gone to investigate, but it is probable the disease is only measles or chicken-pox. Several thefts of sheep and goats have been reported; the great scarcity of food is the main cause of this.

C. C. FOXON, Magistrate.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of November, 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).			RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days	Heaviest rainfall in one day.		Total for Year from July 1st, 1903
	Maximum.	Minimum.					Fall.	Day.	
Central Experiment Farm (Manager)...			92	43	5.22	20	1.58	27th	7.92
Estcourt			96	43	3.62	14	1.45	27th	7.14
Nottingham Road (C. J. King)	7.03	18	1.52	27th	11.39
Adamshurst (Wm. Adams)	5.20	18	1.45	25th	8.02
Hilton (Henry V. Ellis)			90	43	7.40	22	1.63	23rd	11.27
P.M.B., Town Bush Valley (Wilkinson's Nursery)	8.03	19	1.51	27th	12.65
Ixopo, Gorton (Chas. Green)			82	52	3.41	17	.86	24th	4.88
Mid Illovo, Ismont (A. N. Montgomery)			91	46	5.44	15	1.49	28th	7.10
Ottawa	8.15	9	2.25	28th	11.23
Mount Edgcombe (Natal Estates)			90	59	9.07	17	2.81	24th	13.26
Cornubia	9.33	...	...	...	13.85
Milkwood Kraal	7.69	...	...	...	10.54
Blackburn	8.28	...	...	...	11.95
Saacharine	8.80	...	...	...	12.13
Prospect Hall	6.98	...	...	...	10.70
Clairmont (J. R. Blamey)	9.06	19	2.39	28th	14.69
Equeefa (W. Hawkworth)			87	54	7.84	17	1.94	28th	12.60
Umzinto, Beneva (E. W. Hawkworth)			9.05	17	2.69	28th	13.61

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

- No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.
- No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.
- No. 52a.—Englishman of 30, with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well-up in market gardening.
- No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.
- No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.
- No. 66a.—Australian of Scottish parentage, 38 years of age, and has been in close touch with farming in Australia. Has had large experience of wattle growing.
- No. 67a.—Welshman, aged 27. Was overseer on a sugar estate in Demerara. Understands the cultivation of sugar, bananas, rice and certain tropical fruits. Is anxious to acquire local experience, and if necessary, would be prepared to accept a post on a month's trial without pay.
- No. 68a.—Scotchman of 28, well educated, seeks situation on a farm with light duties, such as overseer, storeman, or tutor. Will give services in return for board and lodgings in comfortable home.
- No. 69a.—Englishman, 39 years of age, who has had extensive experience in stock and agricultural farming in South America and New Zealand, is anxious to get on to a large and up-to-date farm in Natal, to acquire local experience. Produces good recommendations.

No. 70a.—Correspondent writes from Johannesburg stating that he would like to obtain light employment on a farm for about twelve months. Is prepared to pay a premium if necessary.

No. 71a.—Scotchman, 29 years of age. Up to three years ago was farming in Forfarshire, Scotland, where mixed operations were undertaken. Is accustomed to the management of dairy and feeding stock, horses, and sheep. Has had about a year's local experience. Produces good Home and colonial references.

No. 72a.—Natalian, 19, wishes to obtain a situation on a farm. Has fair knowledge of Zulu. Is strong, willing, and could assist with clerical work, if necessary. Can be recommended as thoroughly reliable and trustworthy.

Weekly Rinderpest Report up to 8th December, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 26th May, 1903, to date.
<i>Zululand.</i>			
Eshowe District	10	9	361
Umlalazi District	3	2	194
Nkandhla District	...	...	310
Mahlabatini District ...	12	13	215
Entonjaneni District ...	4	7	54
Nqutu District...	...	6	12
<i>Vryheid District.</i>	...	...	236

M. J. HIME,
For P. V. SURGEON.

P. V. Surgeon's Office,
8th December, 1903.

The Agricultural Department of the U.S. is inquiring into the statement of Consul-General Guenther that a new plant has been discovered in South America that promises to supplant the sugar cane and the sugar beet. The plant contains a large amount of saccharine matter and a high percentage of natural sugar properties which are easy to extract. According to experiments made by the discoverer, the director of the Agricultural Institute of Asuncion, this plant is said to yield a sugar which is from 20 to 30 times as sweet as ordinary cane or beet sugar.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	P. H. Boshoff ...	Riet Vlei
		"	A. C. Harding ...	Meadow Bank
		"	J. Snyman ...	Vitzicht
J. Button .	Estcourt, South of Bushman's River	"	N. Grant ...	Brasfontein
J. J. Hodson ...	Lion's River ...	"	J. C. Boshoff ...	Waterhoek
		"	P. D. Kimber	Maritzdaal
		"	H. W. Shaw	Talavera
		"	G. & B. Hutchinson	Boschfontein
		"	W. M. Jaffray ...	Annandale
A. Brown ...	Polela ...	"	C. A. Phipson ...	Strathcampbell
		"	J. Comrie .	Hepburn
		"	H. Pelnefather ...	Home Rule
		"	T. Palframan ...	Watermead
		"	A. C. Hurston ...	The Rocks
		"	J. D. Watson ...	Rainbow
		"	D. . Arbuckle ...	Kenridge
		"	J. Hayes ...	Glen Gariffe
		"	Leslie Bros. ...	Durera
		"	S. Maritz . .	Maritzdale
		"	A. Green ...	Bushhoek
R. Vause ...	Ixopo ...	"	R. Justice ...	Sunset
		"	W. H. Walton ...	Greenvale
		"	K. Houston ...	The Donga
		"	G. Houston ...	Cloverton
		"	G. Cooper ..	Avebury
		"	G. Kippen ...	Kippen's Retreat
		"	F. W. Robinson ...	Car End
A. H. Ball ...	Weenen	"	J. Schofield ...	Deasland
		"	T. Hair ...	Gretna Green
		"	S. C. Van Rooyen	Middleburg
		"	C. Van Rooyen ...	Scottsberg
E. Varty ...	Umvoti, Western Portion	"	Mrs. P. Lotter ...	Schottspoort
G. N. Perfect ...	Umvoti, Eastern Portion	"	W. F. Marshall ...	Mountain Side
R. J. Raw ...	Impephle ...	"	Baletshe ...	Matimatolo
		"	T. Hill ...	Came
		"	S. Faber ...	Virginia
		"	H. Hill ...	Coquidale
		"	Maqundo ...	Natal Colonization Farm
C. Swales ...	Umlazi ...	Lungsickness	P. W. Department	Richmond Farm, near Pinetown
		"	Native, Sam Pawkes	Assegai Kraal, near Botha's Hill
E. G. Olerk ...	Newcastle ...	Lungsickness	J. Kirk	Umlazi Location
		"	S. W. Reynolds ...	Newcastle Town Lands
		"	Madonez, Nangashon & Ingovaan	Tweffontein
		"	Somsen & Barge	Dunferline
		"	L. H. S. Jones ...	Newcastle T. Lands
		Scab	W. A. Lang ...	Millstone Spruit
A. J. Marshall ...	Dundee ...	"	J. T. Watson ...	Bismarck
		"	S. M' Lief ...	Greenock
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gunena ...	"
		"	Esaw Kumalo ...	Olifton
		"	A. G. Spiers ...	Jackalsfontein
		Lungsickness	V. Mhlanga ...	Baitersea
		"	N. Sebeya ...	Dewar

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
C. E. Walker ...	Umsinga ...	Scab	Mshlaowla Utshesi	Mangabayeni
		"	Matoli Ra Majola	Nkomunye
		"	A. Muller ...	Sutherland
		"	Uqomba ...	Vaalkop
J. Chaplin ...	Klipdriver ..	"	P. Nicholson ...	Hobsland
		"	J. Bardner ...	Brakwaal
		"	Umveli ...	Stockville
		"	Umkuzanywayo ...	Blauwbank
		"	D. R. Bester ...	Quagga's Drift
		"	J. Bester ...	"
J. M. Wales ...	Upper Tugela, N.	"	G. H. H. Coventry	Fair View
	of Tugela River	"	W. O. Coventry ...	Acton Homes
R. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	M. Gregory ...	Frischegwald
		"	H. Potgieter ...	Rooipoort
		"	J. Allen ...	Grootvlei
		"	W. Haines ...	Klipspruit
		"	E. Van Rooyen ...	Waihoek
		"	Anderson ...	Bathspruit
		Lungsickness	H. Beukes ...	Roodekop
		"	P. H. Nel ...	Blauwstroom
G. Daniell ...	Vryheid ...	Scab	B. E. A. Rabe ...	Emyati
		"	Sikwata ...	"
		"	Ndotyane ...	Rustplaats
		"	W. Pretorius ...	Denny Dalton
		"	Z. de Jager ...	"
		"	W. Havermann & Kun	Langfontein
		"	W. Magee ...	Denny Dalton
		"	J. Doyer & Fuhlo	Hartskamp
		"	Mahene ...	Stanley
		"	T. Pretorius ...	Sterkstroom
		"	Sekobobo ..	Pivaansbad
		"	Ngingeleza ...	Welgeluk
		"	Nkandumba ...	Wonderfontein
G. Daniell ..	Vryheid ...	Lungsickness	C. Birkenstock ...	Hlobana
		"	Nqumbi ...	Emyati
		"	Inkunya ...	Tweefontein
		"	Nqume ...	Vredehof
		"	Jonas ...	Bloemendal
		"	J. Coetzee ...	Grootgewacht
C. T. Vaughan ...	Paulpietersburg ...	"	Mcatu ...	Haasfontein
		"	P. D. Potgieter ...	Jachtdrift

The Province of Zululand is an infected area under the Lungsickness Act. Individual case under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there are 2 herds of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under:—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni				
Districts ...	...	...	— for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	...	1	"
" North of White Umfolosi and Umfolosi Rivers	...	...	1	"
Total	...	...	2	0

Rinderpest exists at undermentioned places:—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Nkandhla, Entonjaneni, Nqutu, and Lower Umfolosi Districts.

Vryheid District,

M. J. HIME, for P. V. Surgeon,

Principal Veterinary Surgeon's Office, 9th December, 1903.

Return of Fruits, Plants, and Vegetables, &c.*Examined under Proc : 37, 1900. For the month of November, 1903.*

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1903.					
Nov. 2	Potatoes, Seed ...	224 cases	London	Transvaal	Free of Pest.
" 2	" Table ...	1,010 "	"	Goth	"
" 2	" Seed ...	2,600 "	"	"	"
" 3	Lemons ...	30 "	Malaga	Walmer Castle	"
" 3	Potatoes, Seed ...	1 "	London	"	"
" 3	" Table ...	200 "	France	"	"
" 3	Fresh Fruit ...	1 "	Cape Town	"	"
" 3	Potatoes Table ...	1,150 "	Liverpool	Crosby Hall	"
" 3	" Seed ...	600 "	London	Hyperia	"
" 6	Lemons ...	200 "	Australia	Warrigal	"
" 7	Apples, Fresh ...	400 "	Albany	Sophocles	"
" 7	Potatoes, Table ...	119 "	"	"	"
" 10	" Seed ...	23 "	Australia	Suffolk	"
" 10	" Table ...	12 Sacks	"	"	"
" 10	Lemons ...	30 Cases	Italy	Kinfauns Castle	"
" 10	Oranges ...	10 "	"	"	"
" 10	Apples ...	10 "	London	"	"
" 10	Live Plants, Ornamental	1 "	"	"	"
" 16	Potatoes, Seed ...	755 "	"	Umbilo	"
" 16	Palms ...	1 "	"	"	"
" 17	Potatoes, Table ...	550 "	"	Umtali	"
" 17	Lemons ...	110 "	Italy	"	"
" 17	Potatoes, Table ...	40 "	Melbourne	Fifeshire	"
" 17	Potatoes, Seed ...	3,102 "	Hamburg	König	"
" 17	" " " " " "	1,376 "	London	Inkonka	"
" 17	Trees, Ornamental	1 bale	"	"	"
" 17	Oranges and Lemons	100 cases	Hamburg	Kanzler	"
" 17	Trees, Ornamental	4 pots	Calcutta	Umkuzi	"
" 20	Potatoes, Table ...	1,810 cases	London	Beira	"
" 20	" Seed ...	1,724 "	"	"	"
" 20	" Table ...	732 "	"	Briton	"
" 20	Live Plants, Fruit Trees	3 "	"	"	Fumigat d.
" 20	Begonias ...	2 "	"	"	Free of Pest.
" 20	Plants, Ornamental	1 "	Australia	Medic	"
" 24	Fruit Trees, Rose Trees, &c.	3 "	England	Carisbrook C'tle	Fumigated.
" 24	Fruit Trees ...	6 "	Australia	"	"
" 27	Potatoes, Seed ...	67 "	Hamburg	Reichstag	Free of Pest.
" 27	" Table ...	1,500 "	"	"	"
" 27	Mango Plants ...	6 "	Mauritius	Surada	"
" 31	Lemons ...	25 "	Italy	Cleopatra	Fumigated, scale present
" 31	Oranges ...	100 "	"	"	Fumigated, scale present

Custom House, Durban, December 4th, 1903.

C. B. JONES, Examining Officer.

Locust Acts.

ATTENTION is called to Act 33 of 1895, 30 of 1898, and 42 of 1901, and the Rules and Regulations bearing on the same, which require all persons, whether Europeans, Indians or Natives, owning or occupying land, to at once give notice to the Magistrate of the District, the Police, the District Locust Officer, or any other authorised person,

1. Of the laying of locust eggs on their lands.
2. Of the presence of young locusts on their lands.

And it is the duty of every such person on whose land eggs are laid, or where young locusts appear, either by hatching or travelling, to destroy such locusts, to the satisfaction of the Locust Officer or any other authorised person.

Every person guilty of an offence against this Act, or any Regulations passed thereunder, shall be liable to a penalty not exceeding Twenty Pounds Sterling, and in default of payment, imprisonment, with or without hard labour, for any period not exceeding Three Months.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of November, 1903 :—

Name of Colliery.	Labour Employed.						Unproductive Work.*			Coal raised. tons. cwt.
	Above Ground..			Below Ground.			E.	N.	I.	
Natal Navigation	26	152	134	19	485	79	6	13	...	15,763 16
St. George's ...	14	81	76	9	297	89	1	9	...	9,500 0
Elands Laagte	12	22	205	12	180	262	3	3	6	8,920 12
Dundee Coal...	15	14	173	14	141	320	2	11	31	7,520 12
Glencoe ...	16	128	82	9	283	13	1	4	1	6,655 0
Natal Steam Coal	3	6	2	3	230	4	1	2	...	3,410 8
Durban Navigation	...	...	...	...	...	...	52	339	45	2,309 0
Newcastle ...	5	13	12	4	132	4	15	140	2	1,937 1
No. 42 ...	4	18	16	2	92	2	...	...	...	1,627 12
West Lennoxton	1	7	16	2	27	33	...	...	...	1,420 5
Ramsay ...	2	16	13	2	60	38	5	17	10	1,345 2
Central ...	3	38	5	2	68	9	...	...	...	1,180 8
Crown ...	2	7	31	2	32	6	...	...	...	739 0
South African	...	...	...	2	40	4	18	93	7	652 0
Natal Merthyr	2	15	4	2	84	2	4	22	2	642 5
Cambrian ...	...	...	...	...	...	...	19	125	37	400 0
Star ...	1	1	4	1	2	6	...	...	...	123 0
Redmain ...	...	...	...	...	...	...	1	8	...	80 0
Hlabane ...	...	2	...	1	4	...	...	...	...	53 18
Zululand ...	...	...	...	...	...	...	15	100	...	48 18
Vrede ...	1	3	...	...	...	...	...	...	...	11 0
Total ...	107	523	773	86	2,157	871	143	886	141	64,339 17
Corresponding month, '02	120	426	731	87	1,442	918	12	83	54	42,431 11

* Cost charged to Capital Account.

December 8th, 1903.

C. H. L. BARKER,
for Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of November, 1903 :—

	tons.	cwts.
Bunker Coal ...	20,432	16
Exported to :—		
United Kingdom	11	13
Beira ...	62	4
Canary Islands	583	5
Cape Colony ...	151	15
Delagoa Bay ...	39	13
Total (all Colonial coal)	21,281	6

Customs House, Port Natal,
December 1st, 1903.

(Signed) W. L. HOWE,
for Collector of Customs.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write :—

There is certainly a slight tendency indicative of improvement in the market generally; whether it is due to the improvement in the weather, or to the fact that we are close on that season when a little extravagance is permissible, is hard to say; but the fact is worth recording,

that one does not see so many gloomy countenances as formerly. In some lines, especially vegetables, there has been almost a glut on our market. For some months past a certain rule in the Borough by-laws regulating sales of produce has been ignored. This rule specifies that only South African produce and cattle may be sold on the City Market; but tons of foreign goods

have been sold; and now that some City importers are feeling the pinch they are strongly objecting.

Mealies.—Several lots of Natal mealies have been disposed of at prices varying between 8s. 6d. and 14s. per 100 lbs. Imported mealies remain about the same, viz.:—15s. for North, and 13s. 6d. for South, per muid, in Durban.

Forage.—A good demand exists for dry baled forage; and prices have fluctuated between 7s. 1d. and 7s. 9d. per 100 lbs.

Hay.—The market has been stocked with a lot of inferior hay, and prices have ranged between 1s. 4d. and 3s. per 100 lbs. Bedding according to size of load.

Potatoes.—Prices are somewhat easier owing to the large quantity of new potatoes coming forward; but at the same time the market has been a little erratic, for some sales only realised 11s. 3d. per 100 lbs., others were up to 22s. and 23s. 6d. per 100 lbs.

Beans.—About 26s. per 100 lbs.

Onions.—The market has been well supplied with good samples of onions, and prices have varied between 6s. 6d. and 11s. per 100 lbs.

Eggs.—Prices are firm; but not so high as we have known them in former years at Christmas time. During the last fortnight prices have been everything between 1s. 5d. and 2s. per doz.

Butter.—There is a good supply of fresh butter almost every day, and prices have fluctuated between 1s. and 1s. 10d. per lb.

Poultry.—Prices are high, and common fowls have changed hands at prices between 1s. 11d. and 6s.; turkeys (cocks), from 20s. to 30s. 6d. each, (hens) from 12s. 6d. to 13s. 6d. each; ducks, from 7s. 3d. to 10s. 3d. per pair; guinea fowls, 9s. per brace; geese, 9s. 6d. each.

Fruit.—There is a good demand for fruit, and there is a fair supply of the following varieties:—Apples, apricots, bananas, grenadillas, lemons, limes, peaches, papaws, plums, pineapples, mangoes, &c.

Vegetables.—The rains have certainly brought about a change, almost magical, in the vegetable kingdom: and it is a long time since the market tables groaned under such a variety and quantity of vegetables:—Beans, beetroot, carrots, cabbages, celery, chilies, cucumbers, eschalots, lettuce, leeks, marrows, onions, peas, parsnips, radishes, rhubarb, spinach, tomatoes, and turnips, at prices which were certainly in favour of the purchaser.

Sundries.—Under this head there has been a considerable falling off. Mutton, 6jd. to 8d. per lb.; bacon, 7d. per lb.; hams, 7d. per lb.; pork, 5jd. to 6jd. per lb.; rabbits, 9d. to 2s. each; pigeons, 2s. 4d. to 2s. 6d. per pair.

Firewood.—Poles, 7jd. to 11jd. per 100 lbs.; cut wood, 10jd. to 1s. 0jd. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business keeps dull, and money is more difficult than ever to get in. The scarcity of cash is the outstanding feature of the commercial depression now universal in South Africa.

Mealies.—South American grain is worth 12s. 9d. per muid, and North American about 1s. 3d. higher.

Potatoes.—Bring as high as 23s. per bag, though a big drop is probably imminent.

Forage is in small demand at 7s. 6d. per 100 lbs.

Seeds of all descriptions are more or less scarce, as predicted by me some weeks back.

The recent magnificent rains have completely altered the agricultural outlook, and an immense acreage is reported as being under cultivation this season.

JOHANNESBURG.—Our usual special report has not come to hand. Messrs Lepper & Duncan, agents, Box 2177, Johannesburg, report as follows:—Market better supplied. Prices are much the same. Fine rains daily. Bran, per bag of 100lbs. net, 8s. to 8s. 3d.; barley (green), per 100 bundles, 20s. to 40s.; beans, per bag of 200lbs. net, 39s. 6d.; bedding, per load, 10s. to 92s. 6d.; chaff, per bale of 100lbs. net, 5s. to 6s.; ducks, each, 6s. 9d. to 8s.; eggs (new laid), per doz., 2s. 6d. to 4s. 3d.; eggs (colonial), per doz., 8d. to 2s. 6d.; forage, per 100lbs. 6s. 6d. to 8s. 9d.; fowls, each, 3s. to 4s. 6d.; geese, each, 8s. to 10s.; hay, 2s. to 4s.; lucerne, 10s.; mealies, per bag of 200lbs. net, 16s. 6d. to 17s. 9d.; onions, per bag of 125lbs. net, 20s. to 22s.; pigs, per lb., live weight, 5d. to 6d.; potatoes (local), per bag of 160lbs. net, 20s. to 22s. 6d.; salt, per bag of 200lbs. net, 7s. 6d. to 8s.; seed oats, per bag of 130lbs. net, 11s. to 15s. 9d.; turkeys, each, 15s. to 28s. 6d.; tobacco (cut), per lb., 4d. to 6d.; wheat, per bags of 200lbs. net, 23s. 9d.; pine-apples, 5s. to 7s. per doz.; mangoes, 7s. to 8s. per 100.

Tenders for Construction of Dipping Tanks.

TENDERS will be received at the Audit Office, Pietermaritzburg, until noon on Monday, 14th December, 1903, for the erection of Cattle Dips at the following places: Washbank, Ladysmith, Bergville, Van Reenens, Ingogo, Colenso, Estcourt, Mooi River, Weenen, and Ngotse (48 miles N.E. of Vryheid).

Specifications and details of sites can be obtained from the Principal Veterinary Surgeon, Pietermaritzburg, and the District Veterinary Surgeons at Newcastle, Ladysmith, Estcourt, and Vryheid, or from the Magistrate of the Division.

Tenders, in duplicate, marked "Tenders for Dipping Tanks," should be delivered through post by registered letter or by hand, and in the latter case the person delivering the tender should obtain a receipt from the official receiving same.

The Government reserves the right to require an undertaking on the part of two responsible persons to become bound with the successful tenderer for the due performance of the contract.

The Government does not bind itself to accept the lowest or any tender.

(C. BIRD,

Principal Under Secretary.

Colonial Secretary's Office, Natal,
28th November, 1903.

Pound Notices.

THE following stock, unless previously released, will be sold on the 20th January next:—

Utrecht.—Bay mare, about 12.2 hands, shod hind feet, Government condemned brand on left hip.

Weenen.—Reddish-brown ox, branded VB left hind quarter, swallow tail left ear, and two cuts right ear.

Meran.—Black mare, 13.3 hands high, long mane and tail, about 6 years old, no brands. Black mare, 13.3 hands high, small white spots, star, long mane and tail, 6 years old, no brands. Grey mare, 13.2 hands high, long mane and tail, 3 years old, no brands. Black mare, 13.2 hands high, long mane and tail, 3 years old, star, no brands. Brown filly, about 6 months old, no marks. Brown colt, about 6 months old, no marks.

Bulwer.—Bay mare, aged, long tail and mane, very thin, no brands or marks.

Running on the farm "Tatton," near Bulwer, in the Division of Poela, on the 1st December, 1903, and reported to be too wild to be driven to the Bulwer Pound:—Grey filly, about 2 years old, appears unbroken, long tail and mane, about 13 hands, no brands or marks.

Howick.—Black cow, two slits in right ear, tip off left ear, white on udder, lump on dewlap and under left front leg, short tail. Yellow cow, two slits in right ear, tip off left ear, short tail.

Estcourt.—On the Farm Campozi (Glen)—Black two-year-old ox, branded right flank in line as follows, P.I. H.S.

Jackal Spruit.—Light-cream gelding, dark brown points, also ditto mane and tail, height about 14-1, no brand visible. Dark-brown gelding, very faint star, black points, height about 13 hands, no brand visible. 19 mixed sheep, some branded 4 on right side.

Melmoth.—Black gelding, condemned Government brand on near hind quarter, R on off shoulder, age about 7 years, height about 14 hands 2 inches.

Acton Homes.—Six black-and-white Kafir goats, various ear marks.

Nqutu.—Four sheep (2 ewes, 2 lambs), ear marked, no brands

Woodstock.—Black cow, two cuts on right ear.

Running on the farm Norton Radford.—Black-and-white ewe goat, half moon and a slit on left ear.

Paulpietersburg.—Brown mule gelding, black stripe down back, about 13.2, branded S.H.-5087 near side of neck, Y near quarter, about 7 years. Grey mare mule, about 12 hands, branded V.K.-952 near side of neck, RA near quarter, T near shoulder, aged. Iron-grey mare mule, about 12.2, branded SN-2900 near side of neck, white patches on back, C over arrow near rump, aged.

Ladysmith.—Six white Kafir sheep, various ear marks, no brands.

On the farm "Vaal Krantz."—Two merino sheep, branded VR on right side. Black Kafir goat. Blue Kafir goat.

On the farm "Roode Poort."—Hamel merino sheep, no brands.

On the farm "Krantz Kloof."—Three black goats, no brands.

Utrecht.—Mouse-coloured horse (stallion), branded 2 left hip, C E right hip, about 14 hands, about 6 years old, black points. Probable value, £10. The above animal will be sold at the expiry of one month from this date (30th November), if not previously released.

Woodstock.—Black bull calf, white on dewlap and belly, nick out of left ear, small blaze on nose. Probable value, £4. Dark red bull, star on forehead, white speckled on fore legs and belly, point off right ear, white bush. Probable value, £6. The above animal will be sold at the expiry of one month from this date (30th November), if not previously released.

Meran.—Bay stallion, black points, 14.1 hands high, no brands, very old, not in good condition. The above is very wild, seems to be unbroken. Probable value, £7. The above animal will be sold at the expiry of one month from this date (26th November), if not previously released.

Erin.—Black ram goat, white star on forehead. Probable value, 15s. Impounded on November 22nd, by Native Sonda. The above animal will be sold at the expiry of one month from this date (25th November), if not previously released.

Weenen.—Black bull, about 2 years old, white marks belly and legs, cast in left eye, white brush tail, no brand. Probable value, £8. Impounded 21st November by M. Heine, Block No. 11, Weenen. The above animal will be sold at the expiry of one month from this date (23rd November), if not previously released.

The Maine Agricultural Experimental Station (U.S.A.) has been able to carry during summer months from twenty to thirty-five breeding Shropshire ewes on a paddock containing 5½ acres, which produced grass only. The work was continuous for six years, and the breeding animals averaged in weight from 110lbs. to 150lbs. each, shearing 8½lbs. of wool and yielding an average of 1.15 lambs each per year.

Nine hundred and ninety-one tons of molasses were imported into Madeira from the West Indies and Demerara during the past year. They are employed in the manufacture of neutral spirit for the treatment of Madeira wines.—(Consular Report on the Trade of Madeira for 1902.)

The Agricultural Journal

AND MINING RECORD.

VOL. VI.

FRIDAY, DECEMBER 25, 1903.

No. 24.

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Reading Cases for holding a year's issues of the "Agricultural Journal," leather back, cloth sides 26 strings, lettered on side. 1s. each. Binding yearly volumes in cloth, 2s. 6d. each.

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INDEX.—The Index for the volume now ending will be issued as a Supplement with the next "Journal," No. 1., Vol. VII.

Change in the Shape of the 'Journal.'

WITH this issue ends the *Agricultural Journal* in its present shape. In future it will be of Royal octavo size, the size generally adopted by Departments of Agriculture for their official organs. The *Journal* will be issued on the *third Friday* of every month; the contents of the new shape will be more than double those of the present.

The circulation of the *Journal* is most satisfactory; it has nearly trebled the limit which was estimated when its production was decided upon. The circulation is not confined to Natal; from the

Cape Colony, the O. R. C., the Transvaal and Rhodesia there is a considerable and growing number of subscribers.

Every effort will be made not only to keep up to the present standard, but to improve upon it.

The "interviews" of Ergates will be continued. They are of a class of writing which does not appear in the official publications of other countries, but as they are popular, and give in easy colloquial language the practical views and actual practice of men keenly engaged in the pounds, shillings, and pence

work of farming, the information they convey is bound to be of interest and probably of tangible benefit.

The following appeared in our Introductory Remarks, No. 1, Vol. I. :—
 "The value of experience gained by actual experiment and personal observation under the very varying local and general conditions of this Colony can hardly be over-estimated, and the co-operation of those actively engaged as farmers and planters is therefore speci-

ally invited." Taking into consideration the comparatively small number of the farmers of this Colony and the natural aversion of men engaged in out-of-doors occupation to the task of writing, the response, as a casual glance through back numbers will prove, has been most gratifying. The same appeal we put forward again for the *Journal* as it will appear in its new shape.

Passing Notes.

DIPPING TANK LOANS.—A notice with regard to extension of time in granting loans for building dipping tanks will be found in this issue.

EAST COAST FEVER.—A very short time ago, in referring to the many-named disease which is now engaging the attention of South Africans, we announced that, for ourselves, we had official authorisation to designate it by the name of "African Coast Fever." Such was the name given to the disease in his last report, by the leading investigator, Dr. Koch. Soon followed the Bloemfontein Veterinary Conference, and then the last name was abandoned, and the disease reassumed one of its earliest designations—"East Coast Fever." Editorially, we hope this is the final choice; surely the veterinarians have now had time enough to come to a conclusion upon a popular name for this particular disease.

CATTLE DIPPING.—It has been observed that after dipping for the first time, cattle appear to feel the effects more than from subsequent dippings. For this reason the Veterinary Department think it desirable that the strength of the dip should be weakened by adding 1 tankful (400 gallons) of cold water to every 7 tankful of the preparation, instead of 8 tankful as is the present practice. In maintaining the full quantity of liquid in the dip, the ordinary formula may be used. The Department also considers that the dip will not

have such marked effect upon cattle if used cold.

IMPORTED MEAT.—A correspondent writes :—"I am dead tired of imported meat, and every day, nay, at any meal, I am longing for the Colonial product to come within the reach of my purse. The insipidity of the imported mutton is becoming insufferable. It is the mutton I refer to particularly, for that is much worse than the beef. In connection with this wretched stuff I recently made a discovery. One day the leg of mutton served at dinner was of really excellent quality. The next day I told my butcher of the excellence of the joint, and asked for an explanation; and further, I asked whether he could not let me always have the same quality of meat. His answer considerably astonished me, and as he is presumably an authority on the subject, I have thought what he said might be of interest to you, which was :—"The mutton sent by Australia here is of inferior class, and would not find a market in England—it is chiefly of poor, old ewes. Now and then better comes, but only by a fluke; some good stuff intended for the London market gets shut out of a ship, and then it may be convenient to send on that lot in a ship loading for South Africa. Again, if the class of mutton for South Africa is not fully available while a ship is being loaded, the balance of what is wanted may be made up from the superior article. There is the explanation; the best comes to South Africa only by way of a fluke."

The Hon. H. D. Winter.

MINISTER OF AGRICULTURE FEB., 1899—AUGUST, 1903.

THE ex-Minister of Agriculture whose portrait we have the pleasure of giving in this issue, is Colonial born. He was educated at the old High School, Maritzburg. After leaving school, he was with Messrs. A. Fass & Co. for many years, and thereby he received a commercial training. In 1870 he went to the Diamond Fields for that firm, and returned to Maritzburg in 1871. He then purchased transport plant, and continued transport-riding until 1882. During that period—in 1875—he started stock and agricultural farming in Weenen County, and since then he has taken a keen interest in stock of all kinds, and in Agricultural Shows. He was for many years a Field Cornet for the County. In 1889 he was appointed Justice of the Peace. On the change of Government in 1893 he was returned to Parliament as a representative for his County. Among his first attempts at legislation was an endeavour—unsuccessful—to get the imposing of a tax of 20s. on natives leaving the country for work. In February, 1899, as Minister of Agriculture, he joined the Binns Ministry, and in June of the same year, on the death of Sir

Henry Binns, he joined the Hime Ministry. At intervals, in addition to his own particular duties, he temporarily occupied other Ministerial positions—the Ministry of Native Affairs during the absence of the Hon. F. R. Moor, M.L.A., in Australia, and for several months he acted as Colonial Treasurer.

While in office, Mr. Winter was highly esteemed by the members of his staff for his justice in his dealings with them. During his administration much was done to forward the agricultural interests of the Colony; bacterial research was advanced, inoculation against rinderpest was made compulsory, the Tuberculosis Act was passed, the Glanders Act was amended in the matter of compensation, a Proclamation was issued under the Contagious Diseases Act to control the importations of stock, experimental farms were started, forestry was taken in hand, refrigerator cars were placed on the railway, irrigation on an extensive scale was begun, cold storage was established, and much else that must be in the memory of all.

Pedigree Stock for the O.R.C.

ON October 15th last, a large consignment of pedigree stock left London, per the s.s. Hyantes, for Capetown to the order of Commandant D. M. Bresler, of the Orange River Colony. Messrs. William Cooper & Nephews, the proprietors of Cooper's Dip, supplied from their farms one Shorthorn bull, 50 Shropshire ram lambs, 2 large white boars, and 10 large white gilts. These, together with 1 Ayrshire bull, 12 Ayr-

shire cows and some Shetland ponies, were selected by Mr. Frank Webb, of Shenstone (the firm's export agent), on behalf of Mr. Bresler.

The Commandant also took from Holland by the same boat 50 mares and geldings, 7 stallions (Frieslander), 11 ponies, 7 bulls (Frieslander), 7 bull calves, 34 cows, 34 calves, 14 sheep, and 35 pigs.

Dairy Work.

THE EXPERT'S REPORT FOR 1901-02.

THE Departmental Report for 1901 and 1902 of Mr. E. O. Challis, the Government Dairy Expert, is now published. The report, which consists of 48 pages, will be found of much special and general interest by all concerned in dairy work. Mr. Challis deals with his visits of instruction to farmers, with creameries, with railway matters in connection with

the transport of dairy produce, with the supply of milk to the towns, with the proposed dairy work at the Central Experiment Farm, the improvement of stock, his tours in the dairy districts of Europe and America, co-operation, etc. Those to whom the pamphlet has not been sent, and who desire to see it, should make application to Mr. Challis.

Sleeping Sickness.

THE fourth report of the Royal Society on the African sleeping sickness is one of great interest; it advances the knowledge on the subject by a great stride. This report is by Colonel Bruce, R.A.M.C., F.R.S. (personally known to many people in Natal), Dr. D. Narborro, and Captain Greig, I.M.S.

The investigations were carried on at Uganda. Evidence goes to show that the disease was conveyed to that district from certain localities in the Congo. Around the shores of the Ugunda lake for a distance of about ten miles the disease seems to be endemic now. The disease, it appears, is dependent for its transmission to a fly of the tsetse tribe, and that fly keeps to the marshy shores of the lake. The fly is a biting one, and having fed on a man or beast whose blood contains the sleeping-sickness parasite, is capable, for several days, it has been proved,

of communicating the disease germ to a healthy individual. The most important discovery in the mysterious disease—the entrance of the parasite into the cerebro-spinal fluid—was made by Dr. Castellani, and to him all credit is given. The significance of the discovery was not at first realised by Dr. Castellani, who was preparing for his return to Europe. Happily, however, it was immediately realised by Colonel Bruce. During the few days remaining, Colonel Bruce and his fellow Commissioners devoted all their efforts to following the clue, and before Dr. Castellani left he had the satisfaction of seeing proved the most important factor in the etiology of the disease. The report is of much interest, and is written so clearly, and with so much freedom from scientific terminology, that any non-professional reader can easily gather the results achieved.

Old Boer Manna Seed.

THERE has been an application to the Department for what the writer calls Old Boer Manna seed. He says that he has tried Natal and Transvaal storekeepers without success. If this should

meet the eye of anyone who has such seed for disposal he is asked to be good enough communicate with this Department.

Garden Notes for December.

By W. J. BELL, Florist and Seedsman, Maritzburg.

KITCHEN GARDEN.—The main crop of Cauliflower should be sown this month for planting out in January and February. The best sorts are Veitche's Autumn Giant, Late Italian Giant, Early London, and Early Erfurt. The first-named is the largest and finest Cauliflower in cultivation. Specimens have been grown here weighing over 24 lbs. in weight.

The seed should be sown evenly in well-prepared beds.

Cover with some kind of litter, such as straw, hay or grass; the first is the best, as it is free from seeds, and water regularly every day during dry weather. When the seedlings are through, remove a part of the litter in the evening, and in a few days, when the seedlings are stronger, remove the remainder. One ounce of seed should produce a thousand plants.

In dry weather the Cabbage moth will be found very troublesome, and will clear a whole bed off in a few days unless checked.

The best remedy for this is frequent watering, and a watering with thin lime wash every day.

This should be done in the evening in hot weather.

Use Colonial shell lime, or, better still, the waste from the soda water factory, as it is not so liable to burn or injure the young seedlings.

The imported stone lime is too strong.

The young Celery seedlings sown in October and November will require care and attention during hot, dry weather, and there will not be much chance of their surviving unless a very sheltered place has been selected for sowing the seed.

If the bed is at all exposed, the best arrangement is a network of bamboo slats raised about a foot above the bed, say a few inches apart, and over these a little straw which can be removed or replaced as required, according to the weather. The bed should be watered

twice a day, early morning and evening. Sow for succession dwarf Beans, Raddish, Lettuce, Carrot and Beet.

Custard Marrow and early varieties of Tomato may still be sown where frosts do not commence earlier than May.

The best varieties of dwarf Beans are Burpees stringless, Keen's rustless wax, Mont d'or wax, and the old Canadian Wonder.

Flower Garden.—Many varieties of flower seeds may be sown now, and a good display may be had about Easter time by sowing the following:—

Aster, Candytuft, Dianthus, Phlox Drummondi, Petunia Gaillardia, Chrysanthemum-tricolor, and Coronarium, Helichrysum, Cosmos, Coreopsis, Nasturtium and Sunflower.

Margaret and other Carnation should be sown now for spring flowerings.

Dahlias must be well staked, and should be mulched with a good layer of old stable dung, and watered every day in dry weather.

Also mulch Cannas, Phlox decussata, and other perennials that are near flowering.

Chrysanthemums should all be planted out this month on well-prepared, rich ground. If the soil is poor, dig a hole about a foot deep and three feet in diameter, and fill in with a mixture of good soil, well-decayed manure, sharp sand and wood, ashes or charcoal and a little soot; after planting mulch with a good layer half-rotted dung. This conserves the moisture in dry weather, and prevents surface from baking and hardening.

Those who have not propagated by cutting early in the season should take up old clumps, divide them into the required number of roots, cut the tops down, and plant same as for rooted cuttings. These will make good flowering plants and produce fine blooms if disbudded freely.

If blooms are required for exhibition,

one stem only must be allowed for each plant with three breaks.

If for cutting and decorative purposes, only three or more stems may be allowed from each root, and disbudded more or less, according to size of blooms required.

Take each plant as required, and where more than one stem is grown to a plant each should be staked and tied separately.

Avoid the usual practice of bunching the whole plant up to one stake.

Plant out now all kinds of evergreen

ornamental trees and flowering shrubs, also fruit trees, such as orange, Naartje, Lemon, Guava, Loquat, Mango, Avocado Pear, Brazilian Cherry.

This and the following month is the best time to plant evergreen hedge plants, Thugas, Japan Privets, etc.

The budding of fruit trees and roses may be done now, also layering. Many shrubs, etc., that are difficult to propagate from cuttings may be easily propagated by this means where only small quantities are required.

Correspondence.

(To the Editor *Agricultural Journal*.)

SEED MEALIES.

DEAR SIR,—Will some of the readers of this *Journal* kindly tell me the best way to keep mealies for seed? Hardly one-third of the mealies I have sown this year have come up, although the rains, etc., have been all that could be wished for. The mealies I have used for sowing have been kept in tanks.

LEARNER.

(Our correspondent, who lives in Swaziland, would do best, we imagine, to consult with a neighbour of experience. The mealies are not infertile—have not had their fertility destroyed as by kiln-drying—or one-third would not have

come up. Their average fertility may be easily tested by planting, say, a score in a small box to which proper attention could be given, or between wetted flannel. Although all good farmers are always learning, it is possible that unknown to him, "Learner's" mealies have fallen to the cut-worm, and instead of the mealies being to blame, the evil is attributable to that pest. Should this surmise prove correct, "Learner" must not fail to break up his land early in the winter; it is the best known plan for dealing with this pest.—Ed., *Agricultural Journal*.)

Horse Gossip.

ALTHOUGH my orders, writes "Impetuous" in the *Live Stock Journal*, are not to "talk too much about hunting," that subject, like King Charles' head, will obtrude itself at this time of year. Remember this is the first week of November. An ounce of practice is worth a ton of theory, and I have been wondering what your correspondents who claim that a horse is intellectual would say, had they been where I was a few days since. I fear that in this connection I must be (if that be possible!) more egotistical than usual. But it is a free

country, and no one need read me. It is not as if I had got my victim in the corner of a smoking-room for a *viva voce* exposition. I cannot help thinking that some folks, placed where I was, would call, at all events, the horse they were on an idiotic fool, with a most reprehensible tendency towards dangerous practical jokes. Kindness and hospitality combined to make me a partaker of no less a function than the opening day of a pack of harriers—never mind where. Suffice it to say that the country gave one less the idea of boots and breeches than of a

steady old retrieving setter, with No. 6 in the right barrel for black game, and at least No. 4 or 3 in the left on the chance of a roe! Anyone mounted at all at this time of year, may be pretty certain of finding himself on something fairly jumping out of its skin. After admiring the hounds, as well I might, I said to the huntsman that I should not care to be a fox in front of them on anything like half a scenting day. A slight spasmodic twitch of this worthy man's facial muscles led me to suppose that the only rate this pack ever hears is "Ware, rabbit!"

However, to my idiot. The country was heather and snipe bog, with tracks across the latter. My steed's first performance was to cut a caper, off the track, and into a bog, happily not so deep but that, after some hideous floundering, we emerged together. What price diagnosis here? A little later he skipped lightly into a large festoon of wire. What brought it on to a moor, I wonder. However (it was perfectly visible), it entangled his fetlocks, and, to his unaffected terror, tinkled around them as the bangles of a prosperous Hindoo "Chokree" do round *her* ankles; in the latter case, to the wearer's satisfaction. These are two instances out of a score of similar ones. Now, what animal but a horse, merely because he is short of work, would endanger his life or limbs? For the bog, though deep enough for comfort, and a little over, might have been deep enough to swallow him up bodily, and, had he not succeeded in soon kicking himself clear of the wire, where would he have been? I very much fear that I must, as they say on an unconfirmed court-martial, "respectfully adhere to my former finding," viz., that a horse is an unreasoning and stupid animal, but withal possessed of so many good and noble qualities that one is bound to admire him. Falstaff was "not only witty himself but the cause of wit in others." Unluckily the horse, honesty personified personally, is the cause of almost more rascality than any other created being, and therein he differs from that excellent knight! When a dog is full of nonsense he will career

about, pretend to bite his master (only pretend), hunt the stable cat, or even the home poultry or calves. But he will not endanger himself or anyone else. Bulls when fresh will cut awkward capers, and make unmusical noises, but they certainly won't place their necks in jeopardy. Any creature which is terrified out of its life may, in despair, risk that life, but I, who have been all my life among "live stock," have never seen anything but a horse risk its life merely because it feels light-hearted, and with no sort of reason. A camel is the most stupid of tame beasts, from our point of view, but he would not caper and frisk over a precipice, or into a morass, as a mere ebullition of mirth. I grant that, when he gets stampeded in the night, he is perhaps as big a fool as any other beast in similar circumstances. But horses and mules stampede. I wonder what started the 1st Life Guard's horses at Aldershot in the early seventies? No lot of bronchos could have done it better! It was said at the time that one or two of these "black beauties" were never recovered, but whether the statement is correct I cannot say.

I lately saw a very droll instance of how an editor may be caught napping, in a Society paper, which is rather fond of motors. Certain correspondents had written indignation letters complaining that they were not to have all the roads to themselves, also of the enormity of wearing numbers, and being limited to a pace. Among these was a letter from a wag, who declared that so elaborate a machine as a motor had an individuality of its own, was alive in fact. He described how his car, on meeting a four-horse coach with a horn blowing, trembled with fear, and attempted to shy into the ditch, and wound up by saying that the coach was not numbered! All this was taken *au sérieux*, and printed in good faith without comment. I will say, though, that motors are much better behaved since the legislation affecting them was passed, although it has not yet come into effect. They are, however, a precious nuisance out hunting. Say that you want to jump into a road, and you find the only practicable place in the fence

blocked by a car, stuck there while the driver is tinkering at the machinery. You upset your horse by pulling him up, when he well knows that hounds are going on, and probably, when the coast is clear, he will decline the obstacle, and lose you the run. Bicycles are bad enough, as when a fox runs parallel to a road, and up wind of it, they will get in front of hounds and head the fox when he tries to cross said road, as he is pretty sure to do sooner or later.

If you are not tired of the reasoning powers of a horse, I will give you another instance. I had to give £30 more for a hunter the other day than what I considered his market value, because he was guaranteed not to notice road nuisances. Perhaps £10 of this may have been charged for his name, my good friend the dealer telling me that he had great difficulty in finding horses unhogged, let alone undocked. (I had said that I would not look at a hog mane). This, however, is a digression. The point of my tale is that, though this horse allows a motor to pass, or even meet, him at any pace, if a cock robin moves in the hedge as he goes along the road, he will jump from under me as nearly as possible, and when a rabbit started from a patch of bracken in a field the other day I can tell

you, patient reader, that I was thankful he had a mane. Yet he (he is seven off) must have seen very many more sparrows than motors. And by no stretch of imagination could he, as far as we know, think that a robin could do him damage or bodily harm. As to treading on a prostrate man, no horse will do it if he can help it, but neither will he tread on a coat with no man inside it. I have often wondered at seeing how a cavalry rear rank will gallop over a fallen man in front of them without touching him; I suppose they jump over him. Accidents will happen, e.g., a very pet old mare of mine, some two years ago, put her hind foot on my arm, as she rose from the ground after a tumble, and a nice arm I had for some time, but she had rolled right over, and I don't think quite realised the very unusual position in which I was lying in state. Whether the mare mentioned by your correspondent avoided young Hopeful by accident or design matters but little so long as the boy was unhurt. Perhaps she thought that he felt soft, and might let her in. In leading a horse on rough ground always give him as long a rein as possible, then, if he comes to grief, you are not mixed up in the performance, whatever this may be.

Goats' Milk.

GOATS' milk, says the *World's Work*, is much richer than cows' milk. The vulgar notion that it has a peculiar taste is all nonsense. In countries, where cleanliness in utensils and the washing of the hands before milking are not thought much of, the milk may possibly acquire an objectionable flavour; but after repeated experiments on friends with milk from various goats, the writer has never heard people, who tested it for the first time, say any more than that it was excellent and that it resembled ordinary cows' milk. This is the verdict of every goat-keeper.

The richness is not, of course, a matter of opinion. Chemical analysis shows that on every point goats' milk is the superior of cows' milk. In butter-fat its

value is more than double cows' milk. In the nutritious cheese-forming substance its better quality is also marked. As is well known, the owners of cows have often the greatest difficulty in keeping the milk they sell up to the standard of fat, which the adulteration law requires, and are occasionally fined, although they have not added water. Goats' milk, on the other hand, is almost invariably twice as good as the inspectors demand that cows' milk shall be.

CHRISTMAS HOLIDAYS.—Owing to Christmas day falling on our day for publication, it is necessary to issue the *Journal* a day earlier.





THE HON. H. D. WINTER,
Minister of Agriculture, February, 1899—August, 1903.

Successful Farming.

INTERVIEW WITH THE HON. H. D. WINTER, M.L.A.

By ERGATES.

THERE are few better instances of successful farming than that of the Hon. H. D. Winter, M.L.A. As the Property Register shows, he is a large landed proprietor, and all that he personally acquired has principally come through farming. Other men have made their start as farmers with money and land inherited, with money from the diamond fields, but his beginning at farming was practically from the first rung of the ladder. In 1875 he went to the farm on which he still resides, Loch Sloy, some seven miles distant from Estcourt in the direction of Thaba Mhlope. The farm was purchased from the late Walter Macfarlane. The owner having means, immediately commenced with cattle, sheep and goats, and within a year or so afterwards, agriculture suggested itself. It must be remembered that at that time stock farming was more common than agriculture. Mr. Winter viewed the situation in a different way, and year after year he broke up fresh land; this was perhaps looked upon as an eccentricity, or as a useless fad at the best. He pursued the course he had laid down for himself, and the profits attending agriculture justified his action. His principal crops were mealies, forage and potatoes, wheat, which was extensively grown in the County previously, having proved unremunerative.

SHEEP.

Speaking about sheep, Mr. Winter said:—"I began with Merinos, and have never changed; they are active sheep, and in my opinion are the best adapted for the hilly country in this district. I always keep to the German Rambouillet. As to feeding I do but little; only the ewes which lamb in the winter, and the few that look poor at the end of the summer. The general flocks get no help; the winter here is short, and as a rule by the beginning of August there is

good sheep veld. The lambing begins in the middle of that month."

I saw four splendid imported rams. Mr. Winter is one of the biggest sheep farmers in the County, but what he takes the most pride in is the quality of his sheep, and when showing his array of prize cups, he related with satisfaction the triumphs over other noted breeders, which most of the cups signify.

GOATS.

Of goats Mr. Winter is also a breeder. Every year he gets pure bred sires from the Cape, and with the exception of a few not up to the mark, he sells the male progeny as rams. He remarked that some people have difficulty in getting the ewes to take to their lambs. Such trouble he has never had, and he attributes the good fortune to the adoption of the simple plan of leaving the ewes strictly alone at the lambing time. There can be no greater mistake, according to his experience, than that of handling the kids or interfering with their mothers. Given a normal year the number of kids abandoned is insignificant. Mr. Winter also takes a leading position in the Colony as a goat breeder, and his services as a judge in Merino sheep and Angora goat classes are always in much request during the show season.

CATTLE.

"I began," Mr. Winter said, "with Afrikanders, but after a short time I introduced pure Shorthorn blood, which I used to get from the Cape. The herd, however, were, it struck me, becoming too fine, becoming too delicate to stand the winters. To get more stamina and to keep the red colour of my troop I decided some ten years ago to try the Devon, and I have never regretted it. The cross between the Shorthorn and the Devon gives an excellent beast both for

the dairy and for the butcher. At my farm Klipfontein, near Frere Station, they are breaking in young oxen, and when I saw the youngsters this morning I was struck by the little loss of flesh they showed. I get my bulls from Mr. Thomas Hall, whose troop is now practically pure bred. In buying bulls I always make a point of the mother being a good milker."

"About calf rearing?"

"My calves have all been dropped, before the end of October, for I have found that calves which come later are more susceptible to disease, and never grow out so well. This means that the bulls are kept out of the herds for four months."

Readers of this *Journal* may remember how strongly Mr. John Marwick spoke on this subject in my interview with him.

I asked Mr. Winter if he kraaled his calves, and he replied emphatically "No." He said that he only housed them during cold rains. "Calves," he continued, "by close herding and kraaling are bound to get the calf ailments, unfortunately only too commonly known—scours, ringworm, etc.—and soon after the first case appears the whole lot catch it whatever it is. By open air and as much freedom as possible, calf ailments, which frequently prove so fatal, may be largely avoided."

Milking goes on all the year round. Until recently Mr. Winter sent milk to the Natal Creamery, but since the drop in the Creamery's price he has made butter, and has the separated milk for his pigs. For butter he is well accustomed to taking prizes at the County Shows.

CATTLE FODDER; MEALIE HAY.

"What is your winter feed?"

"Mealie hay, coarse mealie meal, turnips, pumpkins, water melons, and sugar cane. In mealie hay I am a great believer. I began growing it over twenty years ago, having got the notion from Mr. Paxton. I am glad to see that the growing of this first-class fodder is now becoming common. I sow the mealies broadcast in the middle of January. When fit it is cut with an old

mower; the stalks are stood on their butts in cocks about eight feet in diameter just as the picture shows in your interview with Mr. Jack Moor. Ensilage is also good fodder, but I prefer the mealie hay."

PUMPKINS AND WATER MELONS.

"Since rust spread through the forage of the Colony I have fed on pumpkins and water melons largely. At planting time their seed is mixed with mealies and all the three are sown together. No, the scruffling for the mealies does not injure the young pumpkins; the vines are just pushed aside. Then, in addition, I put in a field of pumpkins by themselves. In harvesting them, the greatest practicable care is given not to bruise them. If not bruised they last a long time; I have even now some remaining from last year. Thick skinned varieties are the best for keeping."

"Since we cannot grow forage for winter feed any longer, it would be of great service if a rust resistant wheat could be found. Before I left Office I gave instructions for enquiries to be made for such wheat, and possibly some may be obtained."

SUGAR CANE.

"Sugar cane does fairly well with me, and I am going to put in more for it is a most valuable fodder. Towards the Coast it does better; here we have too much frost and too little moisture."

"Before rinderpest I used to stall-feed cattle on a considerable scale. The food was principally chaffed mealie fodder, turnips, and coarse mealie meal, damped with salt water. These stall-fed beasts brought big prices in the spring, and combined with the large amount of first class manure, I found this plan of stall-feeding very profitable. By the way, the cleaning out of my sheds and kraals is always done in wet weather, or, at any rate, while the manure is wet. By this plan the manure heats and kills the innumerable seeds of weeds it contains; this job is commonly done in the Colony, when the manure is quite dry—just powder or hard slabs."

POULTRY.

Some hundreds of Minorcas were running about the homestead. Mr. Winter is rigid as to keeping distinct breeds. He has also kept Spanish and Orpingtons; on an adjoining homestead he runs Plymouth Rocks. The birds have a big free run among orchard and other trees, and keep in good health. I saw between two and three hundred "incubator" chicks, but with real hens impressed for the work of mothering them. Turkeys are also run—the American bronze type. Never having had any good fortune with this section of the poultry yard, I asked how they prospered so well. "The secret of success here," he said, "is in the leaving of them alone. Let them make their nests where they like; the more they are spread out the less will be the losses from disease. When young, feed on wheat bran and milk twice a day, and later on, once a day. Young turkeys require lots of exercise—they are great gluttons. I grow a strip of barley for them. One of my turkeys turned the scale at 40 lbs.

CULTIVATION.

Every year Mr. Winter has under the plough some four hundred acres, the principal crops being mealies and forage. He has some Boone seed, and is looking forward to seeing how it will suit this Colony.

HORSES.

He has always bred a few riding horses. While speaking of horses, the deterioration of the hack naturally cropped up. Mr. Winter incidentally referred to his having often ridden to Maritzburg before the railway was constructed, in a day, or rather in a night, leaving after sundown, and arriving at his destination in time for breakfast, a distance of 68 miles, on one horse. On a certain occasion, in 1882, he returned on the following night, and the horse showed no distress. "It is the cart horse blood," he said, "that spoils our horses for hacks. The cart horse, however, is a necessary evil; the towns want him and pay well for him."

AFRICAN COAST FEVER.

On this topic I ventured to put some questions. This subject has difficulties of

its own and extraneous. More knowledge about it is being continually gathered, and a Minister who is out of Office only a few weeks must naturally feel some hesitation in expressing views on what may become a burning Departmental question. He said, "We are, I consider, in a much better position than we were some months ago. Our efforts have kept it out of the country, and now that the Transvaal is organising steps to control the disease, the risks are diminished. Our laws have been made more strict, and dipping stations have been placed along the borders. If there should be isolated outbreaks they should be stamped out. With the powers now at the disposal of the Government, I think the disease on an extended scale should be kept at bay for a long time, and surely at some early date Dr. Koch, or some one else, will have discovered a cure. At the same time the Government should do whatever they possibly can in erecting and assisting the farmer in building tanks, in case that it should be necessary to make dipping compulsory."

SETTLEMENTS.

In reply to some questions on "close settlements," Mr. Winter replied:—"There are two or three things I took into consideration when dealing with this subject. We want more white population, and the population most eager to start farming is without means to any extent. Such a population requires conditions whereby returns are soon got, and the necessary preliminary expenses are small. Then there is the fact that the Colony has some magnificently fertile land where water is always available, and where, in consequence, quick returns at trifling outlays in capital may be got. Hence the Weenen and Tugela irrigation works for the close settlements."

JUDGING AT SHOWS.

Few men in Natal having had greater experience in judging at shows than Mr. Winter, I asked him a few questions on the subject of judging. He said, "I think our present system, or rather want of system, should be mended, and if the parent Society, with the aid of delegates

from the other societies, would elect and register Judges, the judging at our shows would be put on a much more satisfactory footing. A list of such registered Judges would be of the greatest service to all country societies. I can say that with authority, for I have been President of the Weenen Agricultural Society for many years, and member of it since 1874."

FINAL.

During my visit I did not notice much that was absolutely novel in farming; everything in implements, etc., was well up-to-date, but nothing, on any scale,

was in advance of the conditions the phrase implies. Another point which struck me was Mr. Winter's full and thorough knowledge of every detail in practical farming, and as all the experienced know, they are many. Farming has proved profitable for him, and, what is possibly more fortunate, farming in one and all its phases, profitable or not profitable, is obviously of interest inexhaustible to him. On many of the subjects which cropped up in our conversation his remarks, as will be noticed, were broad and general; the time unfortunately at my disposal did not permit of my going into the subjects with fuller detail.

Bacteriology.

ITS ORIGIN AND PROGRESS.

A lecture by Dr. E. A. P. THURSTAN, Adelaide University.

(Concluded.)

The foregoing sketch of the history of our science will have done a good deal, I hope, towards enabling you to understand the brief description of the processes whereby bacteriologists do their work, which I now propose to give you.

The system is practically that recommended by Koch. One of the first things noticeable about germs is that some can only live in some host, that is, to use a botanical phrase, they are *parasites*. A parasite is an organism which does not elaborate its nourishment for itself, but takes it ready made from another. Some bacteria are strictly parasitic, that is always so. When they invade a person he has to support them, whether he likes it or not, like a rich man with poor relations who insist on sponging on him, instead of earning their own living. Those germs which are not parasites are called saprophytes. Some are not strictly parasitic, but have the *faculty* of being so (*facultative* parasites). Again, there is a very broad distinction to be drawn between two classes, one of which can only live in the presence of air, as we ourselves do; these are called aerobic. Some

bacteria have the power of liquifying solid gelatine; others have not. These are called respectively liquifying and non-liquifying. Some have free powers of movement, others have none—mobile and non-mobile. You would be surprised at the lovely colours that are developed when certain germs are cultivated. This, again, is used as a means of discriminating. There are milk-white, lemon-yellow, golden, scarlet, purple, and so on. These are called chromogenes—colour bearers. Others are aerogenes or gas generators, or zymogenes—ferment formers. We have the power of forming ferments inside us, one of which digests meat, and another changes starch into sugar. Various fruits and vegetable substances also possess this power. The Papaw fruit is rubbed over freshly-killed meat in the West Indies to render it tender. Another means used for discriminating between different germs is their size. By way of forming a standard we speak of bacteria as a fraction or multiple of a micromillimetre, this being the 1-2,500th of an inch. In writing of this, we use the Greek letter mu (μ), as

equal to one micromillimetre. An ingenious machine has been invented for counting the germs present. A piece of glass in a frame is divided by lines and cross lines by cuts with a diamond, each, say, a quarter of an inch apart, or a millimetre, that is 1-25th of an inch, apart. By counting the number in one division and multiplying out we get the total in any given area. Even with a high-power microscope it would not be easy to recognise bacteria were it not for an ingenious process known as *staining*. It is found that both germs and the tissues they lie in vary in the readiness with which they become coloured by dyes. It is also possible to take out the stains after they have been put in. Here, again, different structures vary in the readiness with which they part with their colour. Advantage has been taken of these properties to get the several parts of a preparation differently stained and thus get the benefit of contrast. The colours used are known as aniline dyes, all got out of that wonderful Pandora's box, coal-tar. A surprising number of shades can be obtained from this source nowadays. All the thousand and one tints of ladies' dresses, for instance, are derived from the gasworks. Vegetable dyes will soon be a thing of the past. The only colouring which has resisted the march of modern progressive discovery is the red of the British soldier's uniform. This is still dyed with cochineal, as that stands the weather better than anything else. The principal staining agents used by microscopists are Fuschin, Methylene Blue, and Gentian Violet. In order to keep well the colours are preserved in strong alcoholic solutions, and diluted when wanted. Most of you, doubtless, know the strips of glass called slides that are used for microscopical work, with the very thin circles or squares of glass known as cover slips, to put on that part of the slide where the object is. With great care, to prevent too many germs appearing, a minute portion is smeared on the slide (known technically as a "smear"), which is dried by passing lightly through the flame of a spirit lamp. A drop or two of staining fluid is let fall on it, and warmed in the spirit flame for a few

seconds to hasten the process. Different stains need various times—fuschin only requires a few seconds. One smear consists of the albuminous material of the animal containing the bacteria, and these themselves consist of two parts, a cell wall, and inside that a spore, perhaps. If the staining is too deep we "cannot see the trees for the wood," as the quaint old phrase has it. We therefore take away the stain from the albuminous material by washing it in alcohol, leaving it in the bacteria. Sometimes we stain the general substance a reddish colour with eosine or vesuvin, so as to have red on blue. With a lens whose focus is only 1-12th of an inch there is barely room for the thinnest cover slip, and to protect the lens from being scratched we put a drop of cedar oil on the slip and plunge the object glass in that. Hence it is often called an "oil-immersion lens." Altogether a microscope is a costly toy. There is an apparatus for throwing microscopical subjects direct on to a magic lantern, but it is very expensive, and there is not one in the State. We must wait till we can grow Carnegies here before we can afford such luxuries. Having decided whether we have bacteria present, and whether they are bacilli, cocci, or spirillae, we now pass on to cultures for further information. Bear in mind what incredible numbers may be present, and how difficult it is to prevent other germs floating in the air or on the apparatus from gaining access to the specimen from which you wish to isolate some particular bacterium. It is very hard to realise, I know, but it is the essence of bacteriology. By the most scrupulous, almost fidgetty, attention to detail, the modern surgeon has successful results in daring operations, at which his predecessors in the profession would have stood aghast. You remember what I told you of Koch's work? This is still the process of the day. You sterilise nutrient agar-agar or gelatine; you dilute and re-dilute your material in test tubes of this; you pour the last dilution on to a glass plate and put it aside in a culture chamber kept at a regulated heat, like an incubator, for a day or several days, as the case may be. When colonies

are seen with the naked eye, a minute portion is fished out with a platinum needle and examined under the microscope. One or the other of the colonies on one of your plates is almost sure to consist of the germ you are searching for. From that you can inoculate fresh nutrient gelatine and get a pure culture. Besides this culture test, there are others. Prepare several tubes of gelatine and let them solidify. Dip a platinum needle into the colony and plunge it into the solid gelatine to the depth of an inch or more. Seal up the test tube with cotton wool, just as Schroeder and Von Dusch did over half a century ago. This is called, technically, "a stab." There are several things to be learned from it.

The channel made by a fine needle plunged into gelatine is so small that air will hardly go down it. At the very bottom of the burrow may be one or two germs almost smothered in gelatine and excluded from air perhaps entirely. You remember I told you that some germs will only live in air, and others only when the atmosphere is excluded. By observing whether most growth takes place at the upper part of the stab or the lower, or whether *exclusively* at the bottom of the puncture hole, or on the top, you know whether your bacteria are aerobic or anaerobic. You can also observe whether the gelatine becomes liquified or not—whether colours form or gas is given off. If very little growth takes place at the very lowest part of the stab it may be necessary to pour a little liquid gelatine on the top of the solid to seal up the puncture and more completely exclude the air. Sometimes bacteria will not do well on nutrient gelatine, but flourish on some solid medium, such as potatoes, carrots, turnips, and bread. Some animal fluids, such as milk and blood serum, are also used. In my succeeding lectures you will hear a good deal about milk which will convince you that it is a first-class medium in which to cultivate germs. If potatoes are to be used, they are thoroughly washed and cooked in their jackets. They are cut open by a carefully sterilised knife—even the hands are washed before touching the potato. When the tuber is sliced through it is not

opened out until it is in the damp chamber. A minute scraping from the tissues is spread on one half. To dilute it, a little from this is spread on the second half potato and some from that on a third, and the last one is set to develop in a culture chamber.

To completely fulfil Koch's conditions, it is necessary, after having obtained a pure culture, to inoculate an animal with them to ascertain whether they multiply, and also reproduce the original train of symptoms. Then the germ must again be isolated from the second animal.

We have now traced the whole process through. I fear some of it may have been a little dry, but it is impossible to acquire any knowledge worth having without some little effort. Now that you have mastered the principles on which bacteriologists work, you will be able to appreciate what I have to tell you in the subsequent lectures. In my next one I shall, I hope, convince you that there is a great deal of money to be made by the practical applications that have been made from the investigations of the great pioneers. In my last lecture I shall deal with big questions of public health—how lives depend on the knowledge our rulers may happen to possess on this subject. Everywhere, and in every path of life, we can make bacteria our most useful servants. Like the Trolls of ancient Norway, they will work for us while we sleep. Like every other force, they are very bad masters.

Ladies and gentlemen, this is the great and coming study of the day. It is not possible for many of us to go deeply into the subject, but it behoves us all to take the pains necessary to grasp the principles involved, seeing that sanitation, healthy homes, personal hygiene, a low death rate, the avoidance of preventable disease, legislation against infection, quarantine, and even profitable trade, all are bound up in the questions that bacteriology is called upon to solve.

A wise Persian philosopher has thus defined the grades of knowledge :—(1) He who knows not, and knows not that he knows not. This is crass ignorance. (2) He who knows not, but knows he knows not. This is a class we all belong

to in some things. (3) He who knows, but knows not that he knows. This is vague knowledge. (4) He who knows and knows that he knows. This is

thorough knowledge. I hope I have enabled each of my hearers at least to advance from one to another of these divisions.

Veterinary Departmental Reports for November, 1903.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE.—

I HAVE to report as follows for the month of November, 1903 :—

Scab.—Fifteen fresh outbreaks have occurred during the month. Klip River Souty, 3; Weenen County, 1; Lion's River Division, 1; Polela, 1; Ixopo, 1; Utrecht, 3; Vryheid, 5. 41 licenses were raised during the month. Klip River County, 14; Weenen County, 14; Umvoti, 1; Richmond, 1; Umgeni, 1; Lion's River, 1; Ixopo, 3; Utrecht, 2; Vryheid, 4.

Lungsickness.—Six fresh outbreaks have occurred during the month. Newcastle, 2; Dundee, 2; Paulpietersburg, 1; Zululand, 1. Three licenses were raised during the month. Newcastle, 1; Umlazi, 1; Paulpietersburg, 1.

Anthrax.—Eight deaths reported.

Glanders.—Three clinical cases have been destroyed during the month, and five which reacted to mallein.

Quarter-evil.—32 deaths reported.

Vegetable Poisoning.—Three deaths reported.

Redwater.—Eight deaths reported.

Gallsickness.—78 deaths reported.

Rinderpest.—This disease exists in the Districts of Eshowe, Umlalazi, Mabalatini, Entonjaneni and Nqutu in Zululand. These are all isolated cases.

Horsesickness.—Two deaths reported in Zululand. Three cases have occurred in Maritzburg, these being mules which recently returned from Zululand.

East Coast Fever.—You will see from D.V.S. Fyrth's report that cases of this disease still exist at Ingwavuma, but it has not extended from the original infected area. He is conducting experiments regarding Dr. Koch's method of

inoculation. During the month the disease again appeared on our immediate border in the Paulpietersburg District, in the Piet Retief District of the Transvaal. 70 head of cattle died there during the month. Another outbreak occurred in the Transvaal in the vicinity of our border near Luneberg. This was at a native kraal; 10 head of cattle have died.

The fencing of our border from Charlestown to Joubert's Drift is being rapidly pressed forward, and when this is completed we shall be able to dispense with many of our guards. The building of dipping tanks is being proceeded with as quickly as possible, but the distance from the railway of many of these dips has somewhat delayed us.

The quarantine regulations existing along our border are working satisfactorily, and the people of the border districts are assisting us to a great extent. Any case of sickness occurring amongst cattle there are at once reported and investigated.

I put up herewith reports of D.V. Surgeons and Stock Inspectors.

S. B. WOOLLATT.

P.V. Surgeon.

MARITZBURG.—D.V.S. HARBER.

I am glad to report that there are no cases of sheep-scab or lungsickness in my districts. A few cases of mange in horses still exist. One native was convicted and fined £5 for mixing a horse with this disease with others, and a deposition has been made against others for the same reason.

A few deaths (4) from quarter-evil are reported; one from anthrax and four

from redwater. Among other cases, occurred one of Azoturea. This case is still under treatment, but I have small hope of recovery. In another case a horse met with an accident in a paddock by running into a bush-fence. A piece of stick penetrated the orbital cavity, passing above the eye; between it and the lid, to near the skin in the orbital fossa. A good deal of swelling occurred, but complete recovery took place. In another the shaft of a carriage inflicted a punctured wound in the flank. There was prolapse of some few feet of bowel; death from peritonitis occurred in about 50 hours.

DURBAN.—D.V.S. AMOS.

I have the honour to report that the importations have been as follows:—

Sheep—Wethers,	1,932	; rams	
115	; ewes,	64	..... 2,111
Bullocks	.....		297
Horses	..		73
Dogs	..		17
Cows	..		11
Bulls	..		2
Goats	..		1
			2,512

There was also one shipment of animals brought for African Zoological Gardens, comprising 12 deer, 10 monkeys, 1 civet cat, and 1 bear.

Of the sheep, with the exception of 30 from New York and 6 from the East Coast, all came from Australia. These included the best slaughter sheep yet sent from Australia. Amongst them were some cross-bred Lincoln wethers, killing 90 lbs., and the average weight was 60 lbs. throughout. Some useful flock rams also arrived, and some good Merino rams and ewes. The 297 oxen were imported from Madagascar for slaughter. Of the horses, 69 came from Australia, 3 from England, and 1 from the Argentine. All the cows except one came from Cape Colony, and were imported for dairy purposes here.

Horsesickness.—No case has come to my notice during the month.

Lungsickness.—I am glad to be able to

report a decrease in the number of herds under license, two remaining. No fresh outbreaks occurred during the month.

Glanders.—My district has been free from this disease, but I proceeded to Port Shepstone on the 27th on your order to investigate an outbreak there, with the result of four clinical and two reacts being destroyed. A special report has been sent to you on this outbreak.

Tuberculosis.—Eleven animals have been tested, but none reacted.

General.—I have operated on a horse during the month for fractured rib, and after extracting two pieces of rib, the animal made a good recovery.

During the month the Port has been opened again to Australia and Argentine, and I am in hopes of seeing in the near future more importations than there have been of late.

The building of a dip has now been started at the Compound, and should be completed by the end of December.

I am reporting specially on the condition of the Compound, which is very bad, owing to the encroaching of the sand, rendering the inner Compound useless.

Two acute cases of redwater in imported cows have come under treatment, both recovering, but one cow is still very anaemic.

GREYTOWN.—D.V.S. CORDY.

Scab.—No fresh outbreaks.

Lungsickness.—None.

Glanders.—None.

Rinderpest.—None.

Meltsickness (Anthrax).—Mr. Dan Havemann, of Umvoti Poort, lost six head of cattle from this disease in a few days. The carcasses have been buried, and the remaining animals removed to another part of the farm, so that probably no further deaths will ensue.

Generally speaking, there has been very little disease among stock during the month, most animals having now regained their condition, there being a plentiful supply of grass in this district since the breaking up of the drought. In the early part of the month about 30 more deaths from poverty among cattle occurred in the Riet Vlei District.

Many of the cattle in this part of the country came up from the Thorns in low condition, and were thus unable to withstand the long period of semi-starvation on the high veld previous to the rains setting in. I shall be glad to see the contemplated dipping tanks at Greytown and New Hanover completed as soon as possible. These, together with the private tanks already erected in different parts of the district, would place us in a favourable position to deal with the East Coast Fever should the necessity arise.

LADYSMITH.—D.V.S. O'NEIL.

Sheep Scab.—I am pleased to report that the Stock Inspectors are exerting themselves to free their divisions from this disease, which has been a great drawback to the owners themselves, in that they were not able to trek whilst under license to fresh pastures.

Cattle Dipping.—Quite a number of farmers are under the impression that they must dip their cattle, and are consequently sending them to their farms in the O.R.C., whereas the Act gives the responsible Government official power to compel a man to dip his stock on his farm, should the occasion arise as to the necessity of doing so. It is necessary to have dipping tanks at the ports of entry for stock into this district, and to have them safely guarded, and it behoves the farmers to co-operate in preventing the entry of this terrible disease, East Coast Fever, which Professor Koch states will sweep South Africa. From my experience of that disease at Umтали in 1901, I am confident that with the stringent measures advocated by the P.V.S. of Natal, *re* strict quarantine and control of ox wagon transport, associated with dipping, we can still hope to keep it out.

Gallziekte is responsible for the loss of 18 head of cattle throughout the district, otherwise all the stock are doing well owing to the recent rains, which have brought on the veld, affording plenty of good pasture for stock.

HOWICK.—D.V.S. WEBB.

All classes of stock appear to remain particularly healthy.

The principal cases to which I have been called in to attend were epizootic septic pneumonia in calves; this disease will require further investigation before anything definite can be said as to its cause, etc.

Biliary Fever in an imported American horse.—After a prolonged illness this animal succumbed.

Dental caries in a horse.—This had been going on for about three years. I tried to extract the tooth with forceps but the crown broke, so shall have to trephine and punch out the tooth.

Aortic disease in a horse.—This animal suddenly dropped dead whilst being ridden, and I was asked to make a *post-mortem* examination.

Netritis and peritonitis in a cow.—The result of retention of part of the "after-birth." This case had been left too long without treatment, and was practically dead when I saw it.

Parenchymatous mastitis (deep-seated inflammation of the udder) in a cow.—The disease was in three quarters. I am treating it with injection of potas. iodide solution.

VERULAM.—D.V.S. SHARPE.

Scab.—The flocks reported affected last month are now clean, but there are two fresh outbreaks in Alfred County.

Lungsickness.—Nil.

Glanders.—I have re-tested the eight animals which I reported I had put back, of the Tongaat Sugar Company. Of these one mule reacted. At the same time I tested a horse belonging to Mr. Waugh, of Tongaat. This had been in a stable in which a horse that I had previously destroyed for Glanders had been. Mr. Waugh said he would like it tested, as he wanted to be sure it was free from disease before he sold it. I was very glad he did, as it reacted, and the *post-mortem* examination, and that on the mule, confirmed the reaction.

At the end of the month an outbreak was reported among animals of the Barrow Green Estates, Port Shepstone.

On examination, two horses and two mules were found clinically affected with Glanders and were destroyed. Of the remainder that were tested four horses and one mule reacted, and were found on *post-mortem* examination to be affected. I have still two horses and two mules under observation—their temperatures being too high to warrant the application of the test. This will be done on the first opportunity.

General.—Stock on the whole are very healthy. There was an outbreak of disease reported among the P.W.D. animals between Avoca and Mount Edgcombe. On investigation this was found to be due to the cattle eating some poisonous plant. Three died, and the rest recovered on being moved on to fresh pasture.

Mr. S. A. Brown, Stock Inspector of Lower Tugela Division, has been transferred to the Underberg Division, and Mr. E. W. Larkan now resides at Bond's Drift.

MOOI RIVER.—D.V.S. VERNEY.

Sheep Scab.—I am glad to say there is a considerable diminution in the number of outbreaks of this disease.

Lungsickness.—Weenen County is free from this disease.

Glanders.—As stated in my last report, I had arranged to visit Weenen again this month in order to re-inoculate some horses that had not given satisfactory results to the mallein test, three horses especially reacting uncertainly. In addition to these three horses, I also inoculated eight others, all bearing the east military brand. Of these eleven horses, two gave decided reactions, and were destroyed accordingly. These destroyed horses were two out of three I had inoculated the previous month. Full particulars of that inoculation you have in my last report; the other horses gave no reaction. The *post-mortem* examination of these horses proved to be satisfactory, the Russian horse showing very pronounced pulmonary lesions of Glanders.

Sub-Inspector Collyer at the same time tested all the police horses at Weenen and

Umhlumba, and this, together with the tests I had made of the military branded horses will, I hope, be instrumental in finally stamping out glanders from this district.

Redwater.—I had a very acute case of this disease under treatment, the subject being an English Shorthorn bull that had been in the country six months. The animal showed the usual very high temperature, and he passed urine simulating stout and port wine in appearance for three days. I am very glad to say this bull has made a complete recovery. I treated this bull on somewhat different lines; this bull had no Epsom Salts whatever. I have for a long time thought that it was highly probable that a big dose of salts in these acute cases may play some part in reducing the animal's resistance to the extreme anaemia that takes place in this Bovine Malaria. In order to keep this animal's bowels in good order I employed sulphur and frequent hot enemas.

A bad case of Biliary Fever in an Australian mare came under my treatment. After a large amount of nursing this mare has made a good recovery.

An English stallion, the result of a kick, developed paraphymosis of huge dimensions. With proper surgical treatment this case made an uninterrupted recovery.

East Coast Fever.—There have been numerous meetings in the county during the month respecting the erection of dipping tanks, with the result that several tanks are now to be erected. I am sorry to say there are still a large number of stock-owners who laugh at the idea of this disease being caused by ticks, and who are in any case quite confident that the disease is the same as our ordinary redwater, in spite of all the positive evidence to the contrary. With these views these people ridicule the necessity of dipping tanks, and act accordingly.

IXOPO.—D.V.S. POWER.

Scab.—Outbreaks:—Ixopo, 1; Polela, 2. Three flocks released in Ixopo Division.

Quarter-evil.—One outbreak, two deaths. The herd was then inoculated, and no further cases have occurred.

Lungsickness.—None.

Glanders.—None.

Mange.—In some parts of the district this disease is still common, though not near so bad as it was a few months ago.

Redwater.—This disease claimed a valuable animal during the month—a very good imported Friesland bull. This bull had only been in the Colony, three months and had not been allowed out on the veld. There are quite a number of imported cattle in the Ixopo and Polela divisions now, and during the past few weeks five bulls have arrived in Polela from England, three Devons to Mr. Hathorn, and two Shorthorns to Mr. H. Pennefather.

Imported cattle seem to do very well in Polela, in fact I think they do better there than any part of the Colony I have been in. The climate is good, and there are very few ticks to be seen there.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Four fresh outbreaks viz., two in Newcastle and two in Dundee.

Scab.—Three fresh outbreaks in Utrecht Division.

Glanders.—I have had to order the destruction of three clinical cases of this disease. I found that all these cases had been isolated immediately upon their detection by Mr. Van Neikerk, in a small paddock on the farm Reitvlei, which was fortunate, as these precautions undoubtedly prevented the further spread of the disease among the other horses running on this farm. I tested eight in-contact animals, but all failed to react.

East Coast Fever.—Precautionary measures are still being pushed forward as quickly as possible, both as regards fencing and the erection of dipping tanks. The tank at Charlestown is working very satisfactorily, and a large number of horses and mules have passed through it since its completion.

INGWAVUMA.—D.V.S. FYRTH.

East Coast Fever.—This disease seems to be on the decrease in the district, only seven deaths having occurred during the month of November. I think that some, if not all, of the seven sick cattle would have stood a chance of recovery had it not been for the intensely cold and wet nights to which they were exposed, as the attack was not of such a severe nature as in the majority of cases. Practically the whole of the infected veld has been burnt, and with the new grass, ticks are not nearly so abundant as they were. All cattle within seven miles of the Magistracy (which area constitutes the infected area), are kept severely and separately isolated and regularly dipped. The cattle generally are in very good condition and healthy, only those of one kraal being affected, and that situated in a part of the area in which there is only one herd, which is also in strict quarantine.

General.—No other disease exists in the district. A horse has been brought to my notice apparently suffering from an attack of "Nagana" or Tsetse Fly disease. The symptoms were well marked, there being oedematous swelling of the abdomen and legs, marked anaemia, with a very fluctuating temperature, varying from 97 deg. F. to 103 deg. F. The treatment adopted was the exhibition of arsenic, alb. grains x, with Quinine Sulph. drs ij every morning, together with soft nutritious food. Recovery occurred, and the animal's condition is improving. I am watching the case with interest to see if a relapse occurs. The horse had been exposed to the Tsetse Fly, and this led me to suspect "Nagana."

The deaths among the hippopotami mentioned in my last report have been enquired into by me. I proceeded to the U'bumbi, U'bandi and Nymiti pans, where the deaths occurred. Eighteen deaths occurred at the U'bumbi pan and two at Nymiti. These were without doubt due to vegetable poisoning, as owing to the long drought the grasses upon which the hippo feeds had died off, and it appears that the animals had eaten a poisonous plant which flourishes in the vicinity of the pans (the *Datura*

Stramonium). No deaths have occurred this month as the drought has broken, and the vegetation is now well forward.

VRYHEID AND PAULPIETERSBURG.—D.V.S. TYLER.

Tick Fever.—The situation as regards this disease has changed very little since my last report. The disease is still slowly spreading over the border, and we now have several outbreaks about a mile and a half beyond our border opposite Luneberg. I have removed all the cattle from the farm immediately adjoining the border as far as possible, and have endeavoured to create a two-mile zone. This, with the fence which I hope soon to have in course of erection, should prove a considerable obstacle to the extension of the disease. I have had several reports of suspected outbreaks, but have not met with anything more serious than the common Natal Redwater as yet. At a time like this, when stock-owners get alarmed, all sorts of disease are reported, which, of course, is highly desirable, but it necessarily entails a great deal of work on the servants of this department.

The various dips under construction are now making good progress towards completion, but I should be glad to see some of the cattle owners in this district make an effort to construct private dips for themselves. So far as I am aware, not a single private dip is in course of construction.

In this district a private dip could be built on most farms for a comparatively small outlay, especially if several farmers combine. Practically all the farmers can obtain labour on their own farms, and in those cases where they have timber also, only the cement would require to be bought, and I am sure that this would be money very well laid out.

Rinderpest.—Excellent progress towards stamping out this disease has been made during the month; the outbreak near the Mkusi has been suppressed, and there are only two head of cattle sick at Bābanango, so that I think we may anticipate a clean district, as far as this disease is concerned, at an early date.

Lungsickness.—There have been no fresh outbreaks of this disease this month, and at present four head remain under license in Vryheid, and three in Paulpietersburg district.

Scab.—There are now nine flocks of sheep under license and seven flocks of goats, chiefly in the neighbourhood of Bābanango.

General.—There have been four deaths from quarter-evil; two head have died of gallsickness; several of redwater, and two of horsesickness. There has been no case of glanders.

According to King, the colour of a soil, especially when dry, has a marked influence on the temperature, even at considerable depths. The darkest soil, whether black or brown, is usually more than a degree warmer than light coloured soils at 4ins. deep. The best soil temperature for the germination of corn (maize) is 93deg. It will germinate in three days at a temperature of 65.3deg., while it will require eleven days, when the temperature is as low as 51deg. F.

Adulterated beeswax may be detected by chewing a small piece for a few minutes. If the wax becomes pasty and adheres to the teeth, it is adulterated. Pure beeswax is very brittle and should crumble to pieces while chewing. The comb that contains a pound of honey will, when rendered into wax, weigh about one-half ounce. It is quite evident then that very little wax is consumed by the individual when eating comb honey. It is not at all unwholesome when eaten.

A novel remedy for broken limbs of trees is reported from Ohio. Two large trees, one being a maple and the other an apple tree, were recently much damaged by a storm, each having a limb broken, and only hanging on, as it were, by a mere shred. These broken limbs were carefully supported on struts, and bandaged up, much as a damaged limb would be secured by splints. Then melted paraffin wax was applied so as to stop all cracks, and in this way the sap was prevented from escaping, the intrusion of insects was prevented, and rain and moisture were excluded. The broken limb so treated gradually became once more firmly attached to the trunk, and the cure was complete.—“Chamber's Journal.”

The African Trade in Eggs.

I HAVE secured, writes J. Kirk Hunter in the *Agricultural Journal* of Victoria, a comparative statement of the imports for 1901-1902 into Cape Colony, Transvaal and Natal, the latter returns being for nine months only. So far I have been unable to obtain the statistics from Orange River Colony and Rhodesia, but the figures given will suffice to show that the traffic in eggs, like all other trades in Africa at present, is a rapidly increasing one, and the question for determination by our dealers in that product is by what means they can participate to a larger extent in the very substantial and growing business now being done.

Quantity and Value of Eggs imported into Cape Colony during the years 1901, 1902.

Countries whence Imported.	1901 Value.	1902. Quantity.	1902. Value.
	£		£
United Kingdom	2,814	5,724,888	17,319
Hong Kong ...	—	872	1
Natal ...	411	40,924	251
New South Wales	316	134,160	621
New Zealand ...	—	50,000	255
South Australia	173	65,916	393
Victoria...	127	101,196	503
Austria ...	—	8,200	26
Belgium ...	—	19,200	63
France ...	126	61,160	214
Germany ...	102	18,580	141
Portugal ...	1,463	1,486,950	4,280
Madeira ...	31,144	5,408,465	29,561
Canary Islands	337	218,925	726
Argentine Republic	21	48,294	101
United States ...	420	55,080	283
Totals ...	£37,954	14,442,610	£51,688

Transvaal, for year ending 31st December, 1901-2.

1901.	1902.
Quantity. Value.	Quantity. Value.
1,849,524 £14,463	12,249,840 190,094

Natal, nine months ending 30th September, 1902.

2,512,969 £13,413	4,217,888 £18,097
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As previously explained with reference to another article, Cape Colony is the

only one from which I can obtain a detailed return, showing the amounts imported from each country whence any particular article is imported, but as all the Colonies draw their supplies from the same sources, whatever is being done here, and whatever variation is exposed by a comparison of her imports for, say, the last two years, may be accepted as fairly indicating the conditions in the other Colonies unless in the Transvaal, where, owing to the greater and more rapid increase of the population, the ratio of increase of imports is more pronounced.

MADEIRA EGGS.

A glance at the comparative statement of the importations of eggs into Cape Colony for 1901-2 shows that although Madeira maintains her position as principal contributor to the local requirements, her trade actually suffered a decrease of £1,583, as compared with 1901, whilst the value of the United Kingdom's trade jumps from £2,814 to £17,319. Portugal also shows an increase.

That Madeira still continues to contribute more than half Cape Colony's requirements in eggs, is, no doubt, mainly due to her excellent climatic conditions which assist cheap production, and the favoured geographical position she occupies in the track of the mail steamers, thus possessing ample, regular, rapid, and—being carried on deck—cheap transit for all she can produce.

Notwithstanding these advantages, her trade for the past year shows a decline, and the reason is that the United Kingdom is now landing eggs as cheap as those from Madeira, with the further advantages that by their improved methods of packing they have reduced the percentage of breakage to a minimum, and the eggs themselves are better value, being bigger than those from Madeira, and therefore command a better price in the market.

The Madeira eggs are packed in willow baskets of 20 dozen each. The

baskets are lined with paper, and the eggs are packed in rice or other husk, the thin end downwards. They are mostly carried on deck, and, because of the shortness of the trip, and the freshness of the conditions under which they are carried, usually arrive in good condition. They escape the customary rough handling incidental to the storing of ordinary cargo, and the percentage of breakage is consequently very small. I am assured by one reliable importer that with him it has never exceeded 5 per cent., and generally averages from about $2\frac{1}{2}$ to 3 per cent.

The present cost of Madeira eggs is from 8s. to 9s. per 100, duty ($7\frac{1}{2}$ per cent.) paid, Capetown. The baskets are always a good asset, being easily marketable for the carriage of fruit, etc.

ENGLISH EGGS.

The United Kingdom, as the statistics indicate, is second on the list in value of imports, and showing a very considerable increase on her figures for 1901. This satisfactory result is due, as already stated, to the improved methods of packing, and to the recently adopted conditions under which they are carried. Several methods of packing have been tried, but the one most approved is that of a long case about 6 feet long, 3 feet wide, and 18 inches deep, containing 1,400 eggs each. The cases are divided by woden partitions of 3-8 inch deal into four spaces, each compartment is lined all through with straw padding, about 2 inches thick. The eggs are packed in rice husk, and carry exceedingly well, the breakage being very small. They would even carry better were the cases only half the size, as they would be easier handled. So far as freshness is concerned, these eggs give every satisfaction, and this is attributed to the fact of their being carried in a cool chamber at a temperature of about 40 degrees.

IRISH EGGS.

These have recently been arriving in considerable quantities, and they are well regarded being of good size—decidedly bigger than those from Madeira. They are packed in light, but strong

cases, made of 3-8 inch boards, and containing 30 dozen each. The cases are divided into two compartments by a board of the same thickness as the case. The eggs are packed in cardboard trays of thirty-six spaces each, with five trays in each compartment, the thin end of egg downwards, and filled with chopped hay; each tray is covered with a layer of the same packing, and that is covered with a sheet of cardboard. I saw a shipment packed in this way opened, and they turned out very satisfactorily, the few breakages there were being due to the insufficiency and unsuitability of the packing. The top tray had got on to the eggs in the one underneath, and chipped a few. This is an excellent method of packing, and were ample rice, or other fine husk used, it would be hard to beat. These eggs, like the English ones referred to, were carried at a temperature of about 40 degrees.

AUSTRALIAN EGGS.

So far as Australian eggs are concerned, my enquiries elicit the information that the past experience of those who have tried small shipments is so unsatisfactory as to completely annihilate all desire to continue their importation. For this determination two strong reasons are given:—

(a) Our defective method of packing.

(b) The faulty conditions under which they are carried.

The one by its crudeness causes a high percentage of breakage, and the other is more calculated to induce decay than to promote preservation. The ill effects of the two together make success impossible.

The bulk of the eggs received from Australia have been packed in casks containing 1,000 each. This is not a suitable package for the carriage of eggs. It is too heavy, and difficult to handle properly. Its rotundity provides the Kafir with an easy way of shifting it, which, whilst saving his muscle, is not good for the eggs. The packing used has in most cases been bran, and this is unanimously condemned. The moisture it contains generates heat with the inevitable result of destroying the eggs.

The same objection has been advanced against straw packing. Several lots of Australian eggs have been shipped to this market in cases, and packed in salt; but that method was no more successful than the bran packing. The salt "cakes" on the eggs, and in removing it a lot of breakage results.

In other instances preservatives have been used, but their use is strongly condemned. The managing director of the biggest baking concern here, which uses large quantities of eggs, informs me that for their purpose of pastry baking preservative seems to spoil the egg, by reducing the albuminous part to a thin watery substance of no value.

With these unsatisfactory experiences and objections attaching to Australian eggs, it will be easily recognised there is very little encouragement for the importer to continue trying them, and no hope need be entertained of securing or developing this trade until our shippers have adopted more effective methods of packing and shipping, and demonstrated their ability to land the eggs in sound condition, and with the minimum amount of breakage.

With the desire to obtain this much desired consummation, I suggest that those of our export firms who have agents in African ports, should consign a few cases to them packed in different ways, retaining a complete record of the method of packing of each, so that information may be gathered as to the most suitable. In this way only can we hope to secure a share of this very substantial business; as when the importers saw that our methods were at least as satisfactory as those used elsewhere, orders no doubt would follow, and a regular and steady trade ensue.

Light wooden cases of two compartments containing not more than 30 dozen should be used, with abundant packing of rice or other husk, thoroughly dried. Both methods of packing—with and without the cardboard trays—should be tried, and arrangements made for them to be carried in a cool chamber at about the temperature named as adopted with the English and Irish eggs, viz., 40 degrees. They must not be frozen.

Experiments made here show that to achieve the maximum of success, eggs should not be put on their side, but packed thin end down, and in cases where the cardboard trays are not used each egg should be wrapped in tissue paper in addition to the husk-packing.

THE FUTURE OF THE TRADE.

The returns which I have given, although they do not include those of Orange River Colony or Rhodesia, and though those of Natal only cover nine months' importations, are sufficient to show that the trade is one of considerable value. Large, however, as it is, its expansion has been hindered by the scarcity and dearth of supplies. Were eggs more plentiful in Africa, with the usual accompaniment of plentifulness, cheapness, a vast increase of their consumption would immediately be noticeable.

Under normal conditions of price there is, I suppose, no more popular or generally used article of food than eggs; yet, when I was in Johannesburg, a large section of the population was, because of the abnormally high price, deprived of their use. They were then fetching 7s. 6d. per dozen, and at the hotel where I put up, when eggs were included in the breakfast menu, no more than one would be supplied to each guest. The price may be a little lower now, but it is still sufficiently high to provide a substantial margin of profit for the exporter, importer and merchant.

THE death is announced from Paris of Professor Nocard, the well-known French bacteriologist and authority on infectious diseases in animals, at the age of fifty-three years. Professor Nocard was one of Dr. Pasteur's chief assistants in the researches into the curative properties of serums. For several years he was the head of the famous Veterinary College at Alfort, but he resigned that post in order to devote himself entirely to research. He took an active part in combating Dr. Koch's theory of the non-transmissibility of bovine tuberculosis to human beings, and was a very strong advocate of the tuberculin test. Some useful work was carried out by him in reference to abortion in cows and mortality in calves. Last March Professor Nocard stated that he would shortly be able to announce a remedy for the foot-and-mouth disease, but he was struck down before he could complete his investigations.

Fruit-Growing in the Uplands.

IN this final issue of the *Journal* in its present shape, we reproduce from the first issue an excellent article on fruit-growing written by Mr. Bruce Hutchinson. In fruit-growing, the Colony has made great strides during the intervening six years, and, in consequence, the comments of the writer on the backwardness of the Colony in that respect are somewhat out of date, but in its general bearings, the article is now as valuable as when it first appeared.

Most European fruits can be successfully grown in the higher parts of Natal, and it is to be regretted that more attention has not been paid to this branch of farming in the past. Apple, pear, peach, apricot, plum, walnut, fig, nectarine trees, etc., all grow well and bear good fruit, peaches being especially fine in the Upper Mooi River and Bushman's River districts.

Still at the present time there are very few farmers who have planted orchards on anything like a commercial scale. The small quantity of fruit which is put on the Durban and Maritzburg markets comes chiefly from orchards of 50 to 100 trees, which were planted merely to supply the homestead. In most cases these orchards have had little or no attention, and no care was given to the selection of varieties planted, the general rule being to take whatever the nurseryman chose to supply. The natural result of this haphazard system of growing in the past is that the fruit displayed on our markets is, as a rule, of very inferior quality; and also—especially with apples, most of which are of one summer variety—there is a rush of fruit on the markets for a few weeks, and then a failure of supplies till next season comes round.

No doubt more orchards would have been planted but for the serious drawbacks which attend fruit-growing. In the first place, there is the outlay of money and labour for many years without any return. Most apples and pears do not bear anything of a crop until they are

six or seven years old, and even then only a very small quantity; in fact, an apple orchard can hardly be said to bring in a good return till it is nine or ten years old, and pears often do not bear well till about 14 or 15 years from planting. This is a long time to have to wait for a return on all the money and labour necessary to grow a good orchard, and it deters many men from going in for the business at all. But the greatest trial of all to the up-country fruit-grower is hail. It is not only losing the current season's crop, though that is bad enough, but the damage done to the trees by a bad hail-storm is incalculable. In exceptional cases, where a particularly violent hail-storm occurs, the trees are killed outright. Fortunately this does not often happen, but still it is one of the risks which the fruit-grower has to run; and the minor detail of having the fruit crop either partially or totally destroyed every three or four years is almost a certainty in most districts. This constant risk from hail renders fruit-growing more of a speculation than most other branches of farming, though when hail-storms, locusts, drought, and the various insects and blights which attack most crops are taken into consideration, it must be admitted there is a glorious uncertainty about any agricultural farming in Natal, the one great point in favour of fruit-growing being the high returns which can be obtained from a good orchard. Once get fruit trees in full bearing, and even allowing for the loss of every third or fourth crop, there is nothing which gives so high a return per acre as fruit.

Good fruit always commands a high price, and the local markets could take three or four times the quantity available at present. The demand for fruit is steadily increasing; and, considering the small number of orchards which are being planted, there is little likelihood of overstocking even the local markets for many years to come.

THE ORCHARD.

On the whole, there is no other branch of farming which promises such high profits as fruit-growing if only the grower has fairly good luck in the matter of escaping hail-storms. But this is the only point on which the grower must trust to good luck. No amount of luck will make neglected trees into a good orchard. A good profitable orchard can only be obtained by constant care and attention from the commencement. Select the best varieties of trees, especial care being taken to secure those which are suited to the district, as, however well any special variety may suit one district, it does not at all follow that it will be equally profitable in any other place. Cultivation must be thorough, and kept up till the orchard is at least eight or ten years old—longer, if possible.

W. F. Tabor, an experienced New York horticulturist, writing on this subject in a recent number of the "American Agriculturist," remarks:—"The greatest obstacle to successful fruit culture lies in the imperfect preparation of the soil. Most of our soils are deficient in humus or vegetable matter. They are also compact and hard, consequently deficient in moisture. Therefore these two elements must be secured before we can hope to succeed, particularly with small fruits, whose roots cannot extend deep down to draw up moisture from below. I have found that in no way can I secure this needed moisture so certainly as by incorporating humus into the soil, making it porous and permeable to the air, which carries moisture that becomes condensed and stored up for plant growth. This humus can be most cheaply and easily procured by growing such crops as clover, oats, peas, rye, and buckwheat, as time and circumstances allow, and ploughing them under in a green state. Be careful to compress the soil by rolling after ploughing. This green matter quickly decomposes, its moisture feeds the plant and dissolves the mineral elements in the soil for plant growth. I have found it very necessary to deepen the soil in order to hold sufficient moisture, and my land has all been ploughed 12 inches

deep. This has resulted in growing large crops on land where formerly they were ruined by protracted drought. Having properly prepared our soils by deep cultivation and proper fertilisation, let us select such varieties as our location and the demands of the market require. I have found that only by trial on my own soil could I determine their value to me, as some of our best varieties are fickle, and cannot be grown on some soils. . . . Grow what the market demands, which is large, showy fruit. . . . Therefore, the commercial grower must be governed by his choice of varieties by the demands of the market and the adaptation of the fruit to his own soil."

These remarks are just as applicable to Natal as to America. Good cultivation is indispensable. Before planting plough the ground as deep as possible with an ordinary plough, followed by a subsoiler; from 12 to 18 inches deep will put the land in good condition. After-cultivation should consist of at least two ploughings every season, more if possible. The ordinary cultivation of whatever crops are grown in the orchard should be sufficient to keep the land in fair order. But if no crops are grown constant scuffling must be resorted to.

POLICY OF CROPPING ORCHARDS.

Opinions of practical fruit growers are divided as to the advisability of growing crops of any kind in an orchard. Messrs. P. MacOwen and Eustace Pillans, of the Cape Department of Agriculture, very strongly condemn the practice, on the ground that whatever crop is grown must deprive the trees of a certain amount of nourishment. On the other hand, many of the American authorities advise the growing of crops in orchards, especially whilst the trees are young. Continuous growing of grain crops is always bad, as these exhaust the soil too much. The best crops to grow are any sort of vegetables or root crops, potatoes being, perhaps, the best of all, the heavy fertilisation and constant cultivation which they require being of great benefit to the trees. As the trees get older the crops must be kept further from them, leav-

ing a little more land for the sole use of the trees every year. This appears to be the general opinion in America, and certainly it will strike the average farmer as a more reasonable plan than leaving the whole plot for the sole use of the trees. The roots of young trees for the first two or three years cannot extend more than a few feet from the tree, so that a large portion of the land must be absolutely wasted if not cropped. Also, even when the trees are older, and roots may reach over most of the land, it is hardly clear how cropping can impoverish the soil if sufficient fertilisers are given. Of course, the great point in growing crops in an orchard is to fertilise heavily. It is almost superfluous to state that when land is well treated with fertilisers it improves every year, no matter what crops are grown. This being the case, it should be a very easy matter to apply sufficient fertiliser for both trees and whatever other crop is grown, especially if care is taken not to plant crops which are too heavy a drain on the soil. Moreover, the expense of growing an orchard can be considerably reduced by cropping, as the crops raised should more than pay for the cultivation and fertilisers required. And it must be remembered that, whether the crops are grown or not, constant cultivation and manuring are an absolute necessity. It is simply a waste of time and money to plant a tree in a small hole and stamp it in like a fencing post, and then expect that without further attention there will be a good crop in a few years' time. First-class fruit can only be raised by constant attention and good cultivation, and there is no crop which will better repay the money and trouble expended on it.

CLASS OF TREES.

The importation of pears and Japanese plums has opened out a new line in fruit growing, and one which promises to pay well. Pears here are very vigorous growers and heavy croppers, beginning to bear at four years old. Another important advantage is their remarkably vigorous growth, which enables them to recover from the effects of hail more quickly than most trees do. They are

not quite equal in flavour to some of the best sorts grown in Europe, but are a very good fruit if properly ripened. The same advantage can be claimed for Japanese plums—vigorous growth, early bearing, and very heavy crops. In flavour the best varieties are quite equal to any European plums, and their size and appearance are remarkably fine. They are certainly the plums for this country, as none of the European varieties do well here; in a few places they will bear, but, as a rule, they cannot be got to fruit at all, and many varieties will not even grow.

The fly is getting a serious drawback to peach growing; this pest is slowly spreading over the whole country, and unfortunately there is no known remedy. There are still many places up-country where the fly has not reached, and peaches can be profitably grown, but every year it travels a little further north. Unless some practical means of combating this pest can be discovered it will be almost impossible to grow sound peaches anywhere in the Colony in a few years' time.

PACKING.

The packing and get-up of fruit for market appears to be utterly neglected at present. The usual consignment consists of any old cases that can be laid hands on. Empty paraffin-cases, soap and candle-boxes; in fact, any size or shape of box that can be found, are used to pack fruit in. Often no attempt is made at grading; large and small, with a few old rotten ones, are all mixed up together. Some few years ago a consignment of several *sacks* of peaches was placed on the Maritzburg market; the fruit had been brought in about twenty miles by wagon, and its condition can be better imagined than described. Naturally, the price realised was a mere nothing, barely sufficient to pay for the carriage. The grower took the trouble to write to the papers, explaining the whole affair, and stating that fruit-growing did not pay in Natal as there was no market for the fruit. No doubt the gentleman was quite right so far as he himself was concerned; probably fruit-growing never

would pay him, certainly not if carried out on those lines.

Fruit cases should be uniform in size, or at any rate one uniform size for each sort of fruit; rather larger for apples and pears than for peaches and plums. Buyers do not like a lot of different sized cases, as it is hard to judge exactly what each different size will hold. Naturally, the buyer has to protect himself, and the price given for a mixed lot of cases is usually about the value of the smallest. This is not very satisfactory from the grower's point of view, but it is entirely his own fault if he will not take the trouble to get proper cases.

In packing, it is a great mistake to suppose that anything is gained by hiding a few rotten or extra-small fruit at the bottom of the box and putting good ones on the top. Perhaps that particular box may sell well; but the buyers have memories, and are very apt to remember that they have been "done." And if they once buy a case which is unfairly packed, the next time any cases with the same brand are offered the price is sure to be low. **Honest** packing always pays best in the end. Small and inferior fruit will always sell at a price, but pack it by itself, and mark it distinctly as inferior. Never spoil a case of good fruit by putting small and rotten ones in. One more important point in packing is to put the lid on tight; the case should always be filled a little more than level so that the lid has to be pressed on; this holds the fruit firm and prevents it from bruising in transit, as would be the case if the lid was just on loose and the fruit could shake about. If growers would pay a little more attention to these details in packing they would realise a good deal more for their fruit, and buyers would be more satisfied. Most buyers prefer paying a good fair price for a good article to getting a poor and uncertain quality cheap.

SUMMED UP.

On any farm within reasonable distance of the railway an orchard would be found a very useful addition to the usual branches of farming, and it need not

interfere at all with other industries. Unless anyone wishes to go in especially for fruit-farming, six or eight acres are sufficient to make a nice little orchard. This extent, planted with good trees and properly attended to, should in a few years bring in a very fair increase to the yearly receipts. Good trees can now be obtained at reasonable prices, and the cost of laying down a few acres of orchard need not be very high. By judicious fertilising and cropping the after-cultivation can be made to pay for itself. Pruning and general care of a small orchard should not be too great a tax on the farmer's time. It may seem a very long time to wait—five or six years—for any returns, but when the trees do begin to bear the profits are high, and no one who is willing to treat fruit trees properly will ever regret having planted them. One thing must be borne in mind, whatever extent is planted it must be done well. Better only two or three acres of good, healthy, well-cultivated trees than ten acres of neglected ones.

BRUCE HUTCHINSON.

A prominent breeder of shorthorn cattle in Colorado, U.S.A., in an interview, of which a notice appears in the *Texas Stock Journal*, makes the following remarks on the new mode of treating cattle that are attacked with ticks. He purchased a lot of registered shorthorns a few years ago, without noticing that they were carrying the fever tick. As the disease developed several of his best cattle died of fever, and as he says, "that put me thinking pretty hard." He adopted a remedy that was being talked of at the time, and he gives the following description of his mode of treatment: "I began to feed my cattle sulphur with their salt every day in the proportions of one part of sulphur to two parts of salt, in order to induce them to shed their ticks, and the remedy worked like a charm. When the ticks had dropped off, I proceeded to move all my cattle into a clean pasture, where I knew there were no ticks, and kept them off that old pasture for a month or two, until I believed the old crop of ticks were dead, and their progeny had also passed out of existence from the lack of material upon which to develop. My plan worked well, and I adhered to this policy of moving the cattle as a few ticks would appear, until I finally starved the whole tick family out of existence, and my pastures are to-day as clean as any located above the state quarantine line. My experience has demonstrated to my complete satisfaction that the tick problem after all is one of easy solution."

Fertilizers for Oranges.

THE orange growers in Florida ham-mocks have changed the character of their fruit. Fertiliser formulas, studied and tested for years by a class of growers inferior to none in this country, have been perfected. It was an absolute necessity they were under for the amount of stable manure in the State was insufficient for a hundred groves, and even the time honoured system of cow-penning was wholly inadequate.

At first, commercial fertilizers were applied with misgivings, blindly. As late as 1883, a work on orange-culture by A. H. Manville said:—"They may be adapted to the production of annual crops, but are too stimulating and concentrated to be applied to orange trees." So rapidly was the progress of these fertilizers, that in a few years the author recalled the book and burned it. Like our Northern brethren, like the Fruit Culturist, he had advocated composts, but these were soon relegated to the rear. Among the members of the State Horticultural Society, composts became as much out of date as an ox-cart.

The cotton-growers were familiar with Peruvian guano, with cottonseed and Carolina phosphate, but they ran aground on potash. They were afraid it would burn something. The earliest orange-growers used it only in the form of "hardwood ashes" from Canada, and an enormous trade was done in spurious ashes for years.

The advocates of pure chemical fertilizers—"canned goods" their enemies call them—made headway with difficulty. The conservatives and the homespun continually reverted to composts, to muck and leaves. For years the battle over muck was waged in the State Horticultural Society, until at last the mere mention of the word would excite a ripple of laughter. An able member, in a brilliant essay, characterised the carting of muck as a "harmless amusement," which no man whose time was worth anything could afford to engage in. The sarcasm stuck; muck has been laughed out of court.

In 1890 it was thought a daring thing when a successful grower declared that he used 10 per cent. of potash. In 1892 another orange grower, one of the ablest in the State, judged by results, told me he would not have stable manure on his grove as a gift; he would put it on corn and ears, but in his grove he wanted only pure chemicals.

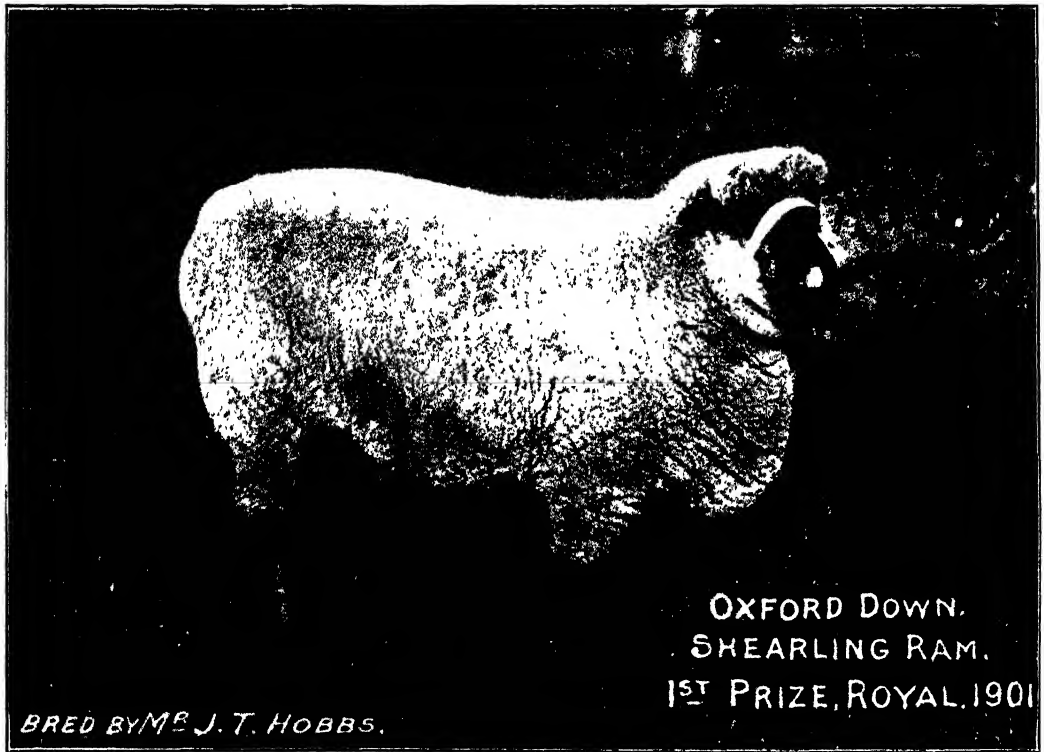
In 1894 a Chinese at De Land, a very intelligent grower, told me he applied the normal formula, and then added enough potash to double the amount, thus giving his trees 25 to 28 per cent. His oranges were wonderfully fine; bright, with a thin, silky tough peel, sweet and of a delicate bouquet; so densely packed with juice that when cut open the juice would spurt out under the knife.

Early in the use of potash, the orange growers turned against the muriate and against kainit. The leader in this practice was decided in his opinion that sulphur is the controlling principle which promotes the conversion of starch into sugar. He observed that a few of his trees which were watered by the overflow of sulphur water from his artesian well ripened their fruit a month earlier than the others and bore sweeter fruit. For the same reason, in part, the sulphate of ammonia is preferred to the nitrate of soda as a source of nitrogen.

The advocates of pure chemical formulas discard cottonseed meal and organic nitrogen compounds, such as blood and bone, linseed meal, castor pomace, though these are permitted by the less fastidious. Even Florida phosphate rock is rejected. The gilt-edge formula reads:—"Sulphate of ammonia, sulphate of potash, bone black, or dissolved bone."

The result of this rigid rejection of organic matter is an orange which, even when grown in the hammock, will carry with only 1 or 2 per cent. of decay, often without any, where formerly it showed 25 to 75 or more. A beautiful, thin-skinned fruit, without crease or blemish, of the highest quality in juice characteristics, and readily commanding from 15s. to 1 a box.

OXFORD DOWN SHEARLING RAM.



OXFORD DOWN.
SHEARLING RAM.
1ST PRIZE, ROYAL, 1901

BRED BY MR J. T. HOBBS.

FIRST PRIZE ROYAL, 1901.

By the courtesy of Messrs. Cooper & Nephews.

Big Farming.

MR. DAVID RANKIN, Missouri, United States, according to "The Prairie Farmer," owns the largest cultivated farm in the world. It contains 23,000 acres, and is all tilled under the owner's supervision. His motto is, "Thou shalt not sell corn," and he rigidly adheres to it. He has not sold even one kernel in his life, because it is contrary to his principles and experiences; he fattens his stock with it. He started in life with a colt his father had given him, and he is now a millionaire. He traded the colt for calves, and with two steers he commenced tillage operations on a farm of eighty acres he had purchased on time payment. He subsequently sold this farm, and purchased more land in the locality in which he now lives, until he acquired the immense cultivated area referred to. The farm is sub-divided into fourteen sections, each under the direct charge of a foreman. The foremen are educated, capable men, and are paid £200 per annum as salary. Under their direction are 200 employees, who are paid from £5 to £6 per month, board, and lodging being found them. It is 35 miles from one end of the farm to the other. On the fourteen divisions are 35 houses, each foreman having a good house for his family, and a large house in which the employees receive their meals. The wife of one of the employees acts as caretaker, Mr. Rankin paying the board. It requires 700 teams to work this farm, most of them being mules. The expenses average £60 per day, the feed alone costing £20 per day, while £60 per annum is spent for chain harness, as there is not a leather tug on the farm. The cornfields cover 14,000 acres, and produced 400,000 bushels of corn. In the feeding season 3,000 to 8,000 bushels of corn are fed in a day. He has 2000 acres under wheat, and the rest in hay and pasture for four years each, when it is broken up. In busy seasons he hires all the horses he can at a dollar (1s. 2d.) per day. He has £10,000 invested in machinery, and is particularly enthusi-

astic regarding two-row cultivators and two-row listers. Rows of corn a mile in length are not unusual on this farm. One hundred acres of corn are planted every time the drills travel two and a-half miles. The paddocks are from 640 to 3,100 acres in size. He feeds from 8,000 to 10,000 head of cattle on his farm every year, and two or three times as many hogs in the same time. Some of the cattle are bought, but the hogs are all raised on the farm. The sale of hogs amounts to £16,000 per annum. His profit last year was nearly £13,000, and has sometimes been as high as £20,000. The employees work ten hours per day, but Mr. Rankin works sixteen hours per day, and this is his only diversion. He has taken two vacation trips only in sixty years—once to Europe, and once to a neighbouring county. He does not smoke, drink, or swear, but he pays very little attention (according to a writer in "The Prairie Farmer") to his personal appearance.

A curious story is told of the origin of ox tail soup. During the Reign of Terror in Paris many of the nobility were reduced to starvation and beggary. In those days the butchers sent their hides fresh to the tanneries without removing the tails; and in cleaning them the tails were thrown away. One of these noble beggars asked for a tail, and it was willingly given to him; he took it to his home, and made (what is now famous) the first dish of ox-tail soup; he told others of his good luck, and they annoyed the tanners so much that a price was put upon the ox-tails.

An important departure in connection with country telephone wires is in contemplation by the Australian Postmaster-General. It is a device to induce persons living outside the township radius of a country exchange to become subscribers. The proposal of the Postal Department is to make a man living 10 or 20 miles outside the township boundary pay for the construction of the telephone line from his house to a point which may be regarded as the boundary, and then carry on the line at the department's expense to the exchange. The annual subscription charged to a subscriber adopting this scheme is to be very low, and no guarantee is to be insisted upon. Departmental officers anticipate that when the system becomes fully known in the agricultural and mining districts it will be largely availed of.

Employment Bureau.

THE Director of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Director will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. When communicating on the subject, farmers may refer to the applicants by quoting the numbers in the following list:—

No. 46a.—Single man, of English parentage, 45 years of age. Has had experience both in England and South Africa, where for four years he was engaged in stock and poultry farming, the cultivation of mealies, fruit, and market gardening. Salary not so much an object as a situation.

No. 49a.—Australian of 25. Has had eight years' Australian experience of sheep and general farming operations on stations. Afterwards cultivated 400 acres of wheat on his own account. Is well up in the cultivation of tobacco; also in the breeding of pigs. Is a total abstainer. Produces good recommendation from former employer.

No. 52a.—Englishman of 30, with varied Home and Colonial experience, seeks appointment as a farm manager. Has some knowledge of Zulu, and is quite capable of managing a store. Is well-up in market gardening.

No. 60a.—Married Englishman of 27, with five years' local experience, desires a position on a farm. Understands the cultivation of potatoes, oats, mealies, &c. Also has knowledge of poultry farming. Was five years in an office.

No. 63a and 64a.—Two young friends who would like to get on to the same farm, if possible. Both have had commercial experience, but are now desirous of acquiring a knowledge of farming, with a view to eventually starting on their own account.

No. 66a.—Australian of Scottish parentage, 38 years of age, and has been in close touch with farming in Australia. Has had large experience of wattle growing.

No. 67a.—Welshman, aged 27. Was overseer on a sugar estate in Demerara. Understands the cultivation of sugar, bananas, rice and certain tropical fruits. Is anxious to acquire local experience, and if necessary, would be prepared to accept a post on a month's trial without pay.

No. 68a.—Scotchman of 28, well educated, seeks situation on a farm with light duties, such as overseer, storeman, or tutor. Will give services in return for board and lodgings in comfortable home.

No. 69a.—Englishman, 39 years of age, who has had extensive experience in stock and agricultural farming in South America and New Zealand, is anxious to get on to a large up-to-date farm in Natal, to acquire local experience. Produces good recommen-

No. 70a.—Correspondent writes from Johannesburg stating that he would like to obtain light employment on a farm for about twelve months. Is prepared to pay a premium if necessary.

No. 71a.—Scotchman, 29 years of age. Up to three years ago was farming in Forfarshire, Scotland, where mixed operations were undertaken. Is accustomed to the management of dairy and feeding stock, horses, and sheep. Has had about a year's local experience. Produces good Home and colonial references.

No. 72a.—Natalian, 19, wishes to obtain a situation on a farm. Has fair knowledge of Zulu. Is strong, willing, and could assist with clerical work, if necessary. Can be recommended as thoroughly reliable and trustworthy.

Weekly Rinderpest Report up to 22nd December, 1903.

Locality.	Number of Deaths.	Number of Sick.	Number of Deaths from 26th May, 1903, to date.
<i>Zululand.</i>			
Eshowe District	3	2	370
Umlalazi District	...	...	194
Mahlabatini District ...	6	2	230
Entonjaneni District ...	3	5	76
Nqutu District...	1	...	14
Vryheid District	...	1	236

S. B. WOOLLATT,
P. V. SURGEON

P. V. Surgeon's Office,
22nd December, 1903.

Some ten years ago, Mr. Philip Ventem, of Catcliff, Bakewell, recorded a curious trait in a half-bred mare belonging to him. This mare was turned out every summer for a three months' holiday in the pastures with other stock. Every season for twelve years she selected a companion, cow, pig, or lamb; and after a few days the friend upon whom the mare set her temporary affections became attached to her and neglected its own kind. In 1892, she was taken up from grass and neighed all the way home, and continued to neigh for several days after she had been stabled, and for some time, when Mr. Ventem drove her past the field where she had been running, she would stop and neigh for her lost friend, which in that year was a lamb.

Return of Farms at Present under Licence for Disease in Stock.

STOCK INSPECTOR	DISTRICT.	DISEASE.	OWNER.	FARM.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	J. Snyman ... N. Grant ...	Vitzicht Brakfontein
J. J. Hodson ...	Lion's River ...	"	G. & B. Hutchinson	Boschfontein
A. Brown ...	Polela ...	"	W. M. Jaffray ...	Annandale
		"	C. A. Phipson ...	Strathcampbell
		"	J. Comrie ...	Hepburn
		"	T. Palframan ...	Watermead
		"	A. C. Thurston ...	The Rocks
		"	J. D. Watson ...	Rainbow
		"	D. C. Arbuckle ...	Kenridge
		"	Leslie Bros. ...	Dunera
		"	S. Maritz ...	Maritzdale
		"	A. Groen ...	Bushhoek
		"	R. Justice ...	Sunset
		"	A. R. Holme ...	Paulholme
		"	G. Houston ...	Newbigging
R. Vause ...	Ixopo ...	"	W. H. Walton ...	Greenville
		"	K. Houston ...	The Donga
		"	G. Houston ...	Cloverton
		"	G. Cooper ..	Avebury
		"	G. Kippen ...	Kippen's Retreat
		"	F. W. Robinson ...	Car End
		"	J. Schofield ...	Deasland
		"	P. J. Van Rooyen	Middleburg
		"	W. F. Marshall ...	Mountain Side
A. H. Ball ...	Weenen			
E. Varty ...	Umvoti, Western Portion	"	Baletshe ...	Matimatolo
G. N. Perfect ...	Umvoti, Eastern Portion	"	T. Hill ...	Came
R. J. Raw ...	Impendhle ...	"	S. Faber ...	Virginia
		"	H. Hill ...	Coquidale
		"	Maqundo ...	Natal Colonization Farm
C. Swales ..	Umlazi ...	Lungsickness	P. W. Department	Richmond Farm, near Pinetown
		"	Native, Sam Fawkes	Assegai Kraal, near Botha's Hill
		"	J. Kirk	Umlazi Location
		"	Pakhna ...	Springfield Flat
E. G. Clerk ...	Newcastle ...	Scab	W. A. Lang ...	Millstone Spruit
		"	J. T. Watson ...	Bismarck
A. J. Marshall ...	Dundee ...	"	S. M'Lief ...	Greenock
		"	N. B. Surtees ...	Gainsford
		"	Hlubi Gumena ...	"
		"	Esaw Kumalo ...	Clifton
		"	A. G. Spiers ...	Jackalsfontein
		Lungsickness	V. Mhlanga ...	Battersea
		"	N. Sebeyi ...	Dewar
C. E. Walker ...	Umsinga ...	Scab	Mshlaowla Utshesi	Mangabayeni
		"	Matoli Ra Majola	Nkomunye
		"	A. Muller ...	Sutherland
		"	Uqomba ...	Vaalkop
		Lungsickness	M. Kanyeli ...	Umsinga Mountain
J. Chaplin ...	Klip River ...	Scab	J. Bardner ...	Brakwaal
		"	D. R. Bester ...	Quagga's Drift
		"	J. Bester ...	"
J. M. Wales ...	Upper Tugela, N. of Tugela River	"	G. H. H. Coventry	Fair View
		"	W. O. Coventry ...	Acton Homes
B. Wingfield-Stratford	Utrecht ...	"	J. Voss, sen. ...	Charlestown
		"	J. Allen ...	Grootvlei

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
R. Wingfield-Stratford	Utrecht	Scab	W. Haines ...	Klipspruit
		"	E. Van Rooyen ...	Waaihoek
		"	Anderson ...	Bathspruit
		Lungsickness	P. H. Nel ...	Blauwtroom
G. Daniell	Vryheid	Scab	Ndotyane ...	Rustplaats
		"	W. Magee ...	Denny Dalton
		"	J. Doyer & Fuhlo	Hartskamp
		"	Mahene ...	Stanley
		"	T. Pretorius ...	Sterkstroom
		"	Sekobobo ..	Pivaansbad
		"	Ngingeleza ...	Welgeluk
		"	Nkandumba ...	Wonderfontein
		"	G. H. Steenkamp	Bloemhoff
		"	J. H. Harris ...	Aradia
		Lungsickness	Nqumbi ...	Emyati
		"	J. Coetzee ...	Grootgewacht
C. T. Vaughan ...	Paulpietersburg ...	"	S. Vere ...	Nooitgedacht
		"	Mcatu ...	Haasfontein
L. Trenor	Alfred	Scab	P. D. Potgieter ...	Jachtdrift
		"	— Fann ...	Backwater
		"	Zanya ...	Location

The Province of Zululand is an infected area under the Lungsickness Act. Individual case under license within this area are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

In this infected area there is 1 herd of cattle under license for Lungsickness, and no flocks of sheep under license for Scab as under :—

Zululand—Eshowe, Umlalazi, Lower Umfolosi, and Entonjaneni Districts	...	...	— for Lungsickness	0 for Scab.
" Nkandhla and Nqutu Districts...	...	...	—	— "
" North of White Umfolosi and Umfolosi Rivers	...	1	"	— "
Total	...	1		0

Rinderpest exists at undermentioned places :—

Zululand.—Eshowe, Umlalazi, Mahlabatini, Entonjaneni, and Nqutu Districts.
Vryheid District.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 22nd December, 1903.

Locust Acts.

ATTENTION is called to Act 33 of 1895, 30 of 1898, and 42 of 1901, and the Rules and Regulations bearing on the same, which require all persons, whether Europeans, Indians or Natives, owning or occupying land, to at once give notice to the Magistrate of the District, the Police, the District Locust Officer, or any other authorised person,

1. Of the laying of locust eggs on their lands.
2. Of the presence of young locusts on their lands.

And it is the duty of every such person on whose land eggs are laid, or where young locusts appear, either by hatching or travelling, to destroy such locusts, to the satisfaction of the Locust Officer or any other authorised person.

Every person guilty of an offence against this Act, or any Regulations passed thereunder, shall be liable to a penalty not exceeding Twenty Pounds Sterling, and in default of payment, imprisonment, with or without hard labour, for any period not exceeding Three Months.

Notice to Stock-owners.

LOANS FOR THE CONSTRUCTION OF DIPPING TANKS.

WITH reference to my notice dated 27th October, 1903, stating that the Government would be prepared to receive up to the 31st of December, 1903, applications for loans from Stock-owners and others desirous of Constructing Dipping Tanks for Cattle, it is hereby notified, for general information, that, in accordance with requests that have been made to me, I have decided to extend the date for

receiving such applications for loans till Monday, the 29th February, 1904.

W. F. CLAYTON,
Minister of Agriculture.

Department of Agriculture,
Maritzburg,
December 19, 1903.

Government Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of Nov., 1903.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1903.	Total for same per'd from July 1st, 1902.
	Maximum.	Minimum.					Fall.	Day.		
Observatory ...	78.6	63.2	87.6	52.4	8.99	19	3.99	28th	13.78	14.09
Stanger... ..	82.2	57.2	98	48	7.84	24	2.68	27th	12.95	17.35
Verulam	83.3	63.2	95	56	7.82	18	2.50	23rd	11.16	13.74
Greytown	82.1	54.1	91	45	9.91	18	1.02	27th	13.37	9.14
Ndwedwe	76.3	56.2	89	46	9.00	20	2.01	28th	13.46	...
Newcastle	90.9	59.3	97	53	4.20	14	1.39	27th	7.03	2.67
Estcourt	84.3	51.4	99	42	3.57	9	1.75	28th	6.86	6.59
Umzinto	82.0	52.5	93	46	9.13	13	3.19	28th	14.53	17.49
Richmond	74.4	54.7	93	46	9.30	23	1.52	27th	13.98	9.99
Camperdown ... ..	...	...	95	35	6.32	15	1.46	24th	...	...
Maritzburg	78.5	57.3	99	48	6.77	20	1.45	27th	9.99	8.37
Dundee	81.8	57.3	95	48	4.74	10	1.82	27th	11.14	3.52
Weenen	88.5	56.1	104.5	44	4.77	14	2.23	28th	7.15	5.35
Hilton Road	74.2	53.3	92	43	5.22	20	1.58	27th	7.92	...
New Hanover	81.7	55.9	100	43	8.71	18	1.55	27th	11.72	8.27
Mapumulo	83.5	53.3	96	35	9.16	12	2.75	28th	13.95	11.86
Nongoma	76.5	55.5	90	47	8.57	14	2.45	28th	...	...
N'Kandhla	72.9	44.4	87	38	9.75	11	3.20	25th	15.01	...
Qudeni Forest	70.8	49.1	86	40	8.36	22	2.53	28th	13.47	13.73
Hlabisa... ..	79.4	50.9	98	50	9.70	10	3.70	28th	13.06	...
Melmoth	78.1	57.1	95	50	6.17	17	2.05	28th	13.53	8.89
Eshowe... ..	75.9	59.9	94	50	6.79	17	2.14	28th	13.69	18.64
Point ... ..	...	...	...	...	7.70	16	2.30	27th	13.08	...
Paulpietersburg	84.9	51.6	95	41	3.47	14	.87	25th	5.26	...
Mahlabatini	83.1	49.2	95	40	10.48	12	5.70	27th	14.42	...

District Reports.

HOWICK, 16th December.—During the latter half of November it rained almost incessantly and the registered rainfall was abnormally high. I notice that this has been the case throughout the Colony. Latterly, however, rain has fallen at intervals of two or three days. The total rainfall to date during December is 2.99 inches. The temperature has been mild, and we have not experienced any great heat with the exception of Friday last, the 11th inst., which was, I think, the hottest day we have had so far, the maximum temperature being 92 degrees. I need hardly

say that both farmers and Natives have been very busy during the last four or five weeks ploughing and planting, and should the rain continue a fairly good harvest may be looked forward to, judging from the crops now in the field. Of late, however, reports have reached me that the mealie grub has been very destructive in various parts of the Division, necessitating replanting, and personal observations confirm this report. Fruit, such as plums and apricots, are plentiful at present. Food amongst the Natives still continues to be scarce, and it may

be necessary for Government to assist in cases which appear to be deserving. Stock is doing exceedingly well. No cases of horse-sickness have, as yet, been brought to my notice.

J. W. CROSS, Magistrate.

MO'I RIVER, 21st December.—Since my last report most favourable growing weather has prevailed, but to counteract this the cut worm has been very troublesome, cutting down the young mealie plants and in many places destroying whole fields. For about a week a very large swarm of locusts was hovering about on the low veld, bordering on the 'horns'; they did considerable damage to anything far enough advanced in growth to attract them. It is reported that they have deposited their eggs along this belt, so farmers may anticipate trouble from "hoppers" later on. Agriculturists are devoting their special attention to the destruction of weeds in their mealie fields, in which they have been considerably aided by having a few days' dry warm weather. Those who have their fields planted on the square system will note the great advantage gained in being able to horse-hoe both ways, and so reducing hand hoeing to a minimum, as against planting the rows one way only, which necessitates a lot of slow, expensive labour in getting rid of the strip of weeds left by the horse-hoes in the rows; also, the advantage of a young mealie plant growing on a square block of ground should be apparent to anyone in favour of a plant with, say, three feet each side and only one foot in the row. The saving in the application of fertilizers is also a matter of no small consideration. Stock generally is doing well, with the exception of late born calves, which are suffering with the usual calf complaints prevalent during this and the next two months. A few cases of "Stiffsickness" in cows have come under my notice. This complaint, which, in my opinion, is a form of indigestion, takes a different form on the high veld; on the low veld the beast affected loses the use of its eyes, though the eyes are apparently not damaged, in addition to the loss of the use of its limbs. The best remedy is to wean the cow from her calf directly the first symptoms are noticed, and allow her to run in a paddock with as few pits and krantzes as possible. A change of veld on to as cool and airy a part of the farm as one can select will also be found of advantage to the animal's recovery. Several large herds of cattle have passed out of and also through this District from Umvoti, travelling with their owners to the new Colonies, where, in many cases, a system of partnership is being practised between the large land-owners in the new Colonies, and the owners, of stock only, in our Colony. The last sale of the Farmers' Association, held on the 9th inst., was a distinct improvement on former sales held recently, though prices realised were very much in favour of the buyers in most cases. Fat oxen, £20; very fat cows, £16 5s.; fat cows, £9 and £10; yearlings, £7, &c., &c. Sheep at about 20s. to 26s. A lot of stock failed to reach reserve figures. Sellers and buyers alike

were disappointed at finding the new kraals not completed in time for the sale. However, as good progress is now being made, everything should be in good working order in time for the next monthly sale. The earlier varieties of summer fruit are now ripening, and promises of a good yield are evident. Some remarks recently appeared in "Farm Notes" in *The Times of Natal* with regard to the danger in feeding separated milk to pigs. My experience is that fresh separated milk fed to the pigs is fatal even though the quantity consumed may be moderate; but if allowed to become curdled in a tub before feeding, they may have as much as they please without any attendant injury. Rainfall for November, 5.7 inches, and from the 1st inst. up to date, 1.6 inches.

CHAS. R. SKOTTOWE.

NONGOMA, 16th December.—With the beginning of November the long extended drought completely broke up, and a rainfall of about 8½ inches during the month effected a wonderful change in the general appearance of the country. From the time the rains started the Natives have been busy in all directions sowing, and all the crops I have seen, so far, are looking exceedingly well, and by the time the sowing is completed for the season, the ground under cultivation will not be far short of the average for other years. By the end of January there should be a small quantity of green mealies available as food for the Natives, and from that time forward they should not require to buy further supplies of grain from the stores. The scarcity of seed for planting has necessitated buying corn grown mostly in Natal, which should tend to alter the varieties considerably, and probably improve the yield, as a change of seed is a matter a Native never dreams of under ordinary circumstances, and he goes on planting from year to year with corn grown on the same ground. Stock of all kinds appear to be doing well, and the district is free of infectious diseases.

R. D. TALBOT, Acting Magistrate.

Pound Notices.

THE following stock, unless previously released, will be sold on the 20th January next:—

Ndwedwe.—Running on Location—Brown mule gelding, brand on right leg (indescribable). Bay mule gelding marked Δ.

Woodend.—Brown mare, about 13.3 hands high, short tail, a bit wild, about 5 or 6 years old. Iron grey filly, looks like a yearling, or a very small 2-year old. No brands visible.

Howick.—Running on the Farm Shooters Hill—Cow, black, with white belly and right flank, upstanding horns, swallow tail and notch out of right ear, aged, no brands has black and white calf.

Ndwedwe.—Cream mare mule, branded 7E on near side neck, shod all round. Brown mare mule, branded 3 on near hind quarter, shod all round.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective Contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—By the time our report is in the hands of most readers, Xmas will again be an accomplished fact; and, in wishing all the compliments of the season, we hope that the New Year about to dawn will be one fraught with good to all; with peace within our borders, and plenty in our stores.

Mealies.—More Colonial grain has been offered during the past fortnight than we have seen for a long time; but owing to the large stock of North and South American, those who have held on for higher prices are now experiencing disappointment. We cannot with accuracy predict, but if reports received are anywhere near accurate, a fall may be expected. America and Canada have record crops, and one reads to-day that Australia's crop of wheat exceeds, by 28,000,000 bushels, all previous records. Therefore, to say that foodstuffs will be cheap in the near future is not an unreasonable assertion. Americans vary between 13s. 6d. to 16s. per muid in Durban; Colonial, from 8s. to 13s. per 100 lbs. samples offered being purchased for seed.

Forage.—Prices for best quality dry forage 6s. to 7s. 6d. per 100 lbs; inferior, 4s. to 5s. per 100 lbs.

Hay.—Fair amount offering at prices varying between 1s. 6d. and 4s. 5d. per 100 lbs.; bedding, from 8s. 6d. to 20s. per load.

Potatoes.—Good samples now offering, a d prices are easier; and while some samples have been as low as 4s. and 6s., others have realised from 10s. to 13s. 9d. The last fortnight has been a busy time with importers; thousands of boxes of English, French and German seed potatoes have been sold in Pietermaritzburg; and from reliable information obtained, never in the history of Natal has so many potatoes for seed purposes been introduced.

Sweet Potatoes.—From 2s. 6d. to 3s. per sack.

Kafir Corn.—A few sacks offered, and prices have been about 7s. 6d. per 100 lbs.

Onions.—No demand; large quantity offering. It is a long time since our market has been stocked to the extent it has been during the past fortnight, and prices have ruled from 3s. to 9s. 6d. per 100 lbs.

Buckwheat.—From 9s. 9d. per 100 lbs.

Poultry.—Common fowls from 1s. 7d. to 5s. 6l. each; ducks, from 6s. to 12s. 6d. per pair; geese, 9s. 3d. to 11s. 6d. each; turkeys (cocks), 15s. to 43s. each; (hens), 8s. 3d. to 12s. 3d. each.

Eggs.—There is always a good demand for eggs at this time of the year, but prices are not as high as we have recorded in previous year. Prices have fluctuated between 1s. 1d. and 2s. 8d. per dozen.

Butter.—The market has been well supplied, at prices varying between 9d. and 1s. 9d. per lb.

Sundries.—Very little meat has been offered during the past fortnight. Mutton has realised from 7d. to 9½d. per lb.; pork, 6d. to 8d. per lb.; hams, 8d. per lb.; rabbits, 9d. to 1s. 6d. each;

pigeons, 2s. 1d. to 2s. 11d. per pair; trussed fowls, 2s. 3d. to 3s. each.

Vegetables.—Market well supplied with the following:—Asparagus, beans, beetroot, cabbages, carrots, celery, chillies, cucumbers, eschalots, lettuce, marrows, mealies (green), peas, parsley, parsnips, radishes, rhubarb, spinach, tomatoes, and turnips.

Fruit.—Apples, apricots, bananas, figs, grenadillas, greengages, lemons, mangoes, oranges, plums, peaches, papaws, pineapples.

Firewood.—Pole, from 8l. to 11d. per 100 lbs.; cut firewood, 11d. to 1s. 1d. per 100 lbs.

DURBAN.—Our usual special report has not reached us at the time for going to press. The following is from the *Mercury*:—Apricots 2s. to 5s. per 100, apples 8s. to 10s. per 100, bananas 2s. to 3s. 6d. per bunch, bananas 1s. to 4s. per 10, beans 1s. to 5s. per basket, butter (fresh) 9d. to 10½d. per lb., butter 1s. to 1s. 3d. per lb., cabbages 6d. to 4s. 6d. per dozen, ducks 4s. to 5s. each, eggs 1s. 8d. to 2s. 7d. per dozen, fowls 1s. 6d. to 4s. 6d. each, geese 8s. to 13s. each, grenadillas 1s. to 3s. per 100, lemons 1s. to 3s. per 100, mangoes 1s. to 6s. per 100, milk 4d. to 6d. per bot., onions 2l. per lb., oranges 8s. to 14s. per 100, papaws 2s. to 4s. 6d. per doz., peas (green) 2s. to 3s. 6d. per basket, pigeons 1s. 5d. to 1s. 8d. each, pigs 30s. each, pigs (suckling) 9s. to 12s. 6d. each, pineapples 1s. to 4s. 6l. per doz., potatoes (round) 10s. to 15s. per muid, potatoes (sweet) 3s. per muid, pumpkins 8s. to 12s. per doz., tomatoes 1s. to 4s. per basket, turkeys 25s. to 37s. 6d. each.

JOHANNESBURG.—Mr. W. H. Thomas, Box 1960, writes:—The market has been considerably compressed lately, everything in general being affected to such an extent that sellers simply realised to get the cash. Produce is very often sold from 10 to 20 per cent. below landed cost. Prices are as follows:—

Barley, for Seed, at per 100 lb. bags.—Very little has been offered for sale; from 12s. 6d. to 16s.

Barley, green, for forage, per 100 bundles.—This is getting scarce and indifferent; from 20s. to 40s.

Bran, per 100 lb. bags.—Not much offering, that which is offered realises very badly; it is not Colonial wheat bran, but is ground in the Colony; 8s. to 8s. 3d. American Bran, 7s. to 7s. 6d.

Bales Chaff, per 100 lbs.—There is not much being offered; Cape Colony chaff realises pretty well, 4s. to 5s.

Mabele, per 200 lbs.—No South African corn offering. Only Indian white at 20s., 21s. 6d.; Indian pale red, 21s. 6d. to 22s.; and Indian red Kurachee, 22s., 23s.

Mealies, per 200 lbs.—A few bags South African have been sold for seed, Yellows, 24s., 26s., whites, 25s., 27s.; South American yellow, 15s.

6d., 18s. 3d., whites, 17s., 18s.; North American whites, 20s. 6d., 21s.

Oat hay, per 100 lbs.—As there is any amount of local forage coming forward, also Colonial, local realises 8s., 8s. 3d.; other from 7s. 6d., 8s. 3d.

Onions, per 123 lbs.—Supplies of good onions are short. The prices, however, are poor, from 18s. to 22s.

Potatoes, per 163 lbs.—As our local potato growers are now lifting their new crops, the

market is crowded daily, and the prices have fallen to 10s. per bag in one week. To-day, 19th December, is the biggest market we have had for some time now. About 1,500 bags were sold. Prices, 10s., 12s., 15s., 16s.

Eggs.—Fresh, per doz, 3s. to 3s. 9d.; Colonial, 2s., 2s. 6d.; Imported, 1s., 1s. 6d.

Poultry.—Ducks, each, 7s.; 8s.; Fowls, 2s. 6d., 3s. 6d., 4s. to 5s.; Geese, 8s. 6d., 10s.; Turkeys (hens), 15s., 17s.; Turkeys (gobblers), 25s. to 32s. 6d.

Agricultural Motors.

AMONGST these—and there are not many—the Ivel agricultural motor tractor is described in the English agricultural Press as having already taken a leading place. It is a tractor essentially, rather than a cultivator; and in many respects, in view of the great variety of instruments other than those which merely turn the soil, which are used in agricultural field work alone, it will be doubtless more convenient to have the former than the latter type of machine. A motor cultivator is well enough of course, but subsoiling can only be done with a plough. The same may be said of draining; therefore it occurs that the tractor is the handier machine. The Ivel agricultural motor is stated to be capable of drawing a double-furrow plough, a harrow and binder; a stripper, a scuffle, harrows, a mowing machine, etc., or in fact any agricultural implement used in deep or shallow cultivation. This work being accomplished, it can be used as a tractor for pulling loads on the road at at least the same pace as the average span of light horses; and though, like these, needing water and food—in the shape of liquid fuel—it needs no time for digestion, and none for rest on the road or in the field. And, withal, it is claimed that it can do the same work in half the time. Again, the tractor, apart from its scope in field or road, can be used for any work at present done by an ordinary stationary engine, such as chaff cutting, root pulping, thrashing, grinding, driving dairy machinery, etc., and requires no skilled engineer to run it. The cost of upkeep is exceedingly small, being the cost of

the fuel merely, used in ordinary running, and is about half, or even less than, that of the cost of the horses required for the same work.

The engine fitted to the Ivel agricultural tractor is a double cylinder horizontal, developing 12 horse-power on the brake. It has electric ignition and water circulation; two speeds are fitted, one forward and one reverse, the brake being put in motion by a lever which actuates the clutch. The tractor complete weighs about 25 cwt., and as this weight is distributed over three wide wheels, the machine hardly makes any impression on the land. The length of the machine is 9 feet 3 inches. The price is £300.

The following extract is taken from the *Encyclopædia Britannica*, Vol. XXV., p. 219:—Expert estimates place the amount of human labour at about 54 per cent. of the whole cost of growing cotton. This is a much higher ratio of the cost of labour than is found in many other industries. It exceeds the cost of labour in corn and wheat growing, and also in manufacturing industries.

Mr. Lockwood Kipling, father of the famous author, gives an account of the curious methods of fattening horses in vogue among the rich natives of India, who admire a fat horse above everything. Such horses, he says, "are born to purgatory rather than paradise." They are fattened by rigorous confinement and rich food. Many horses belonging to persons of rank are fattened by the grooms thrusting balls of food, mixtures of butter, boiled goats' brains and other messes, down their throats; and, as may be expected, many die of a disease of the digestive organs under the process. The contrast between the mode in which young horses in England are allowed to gain strength during their growth, and are well nourished at the time, and those of the Indian nobles that are imperfectly nourished when young, and fattened when old, is great.

Indian Agricultural Research Institute (Pusa)
LIBRARY, NEW DELHI-110012

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